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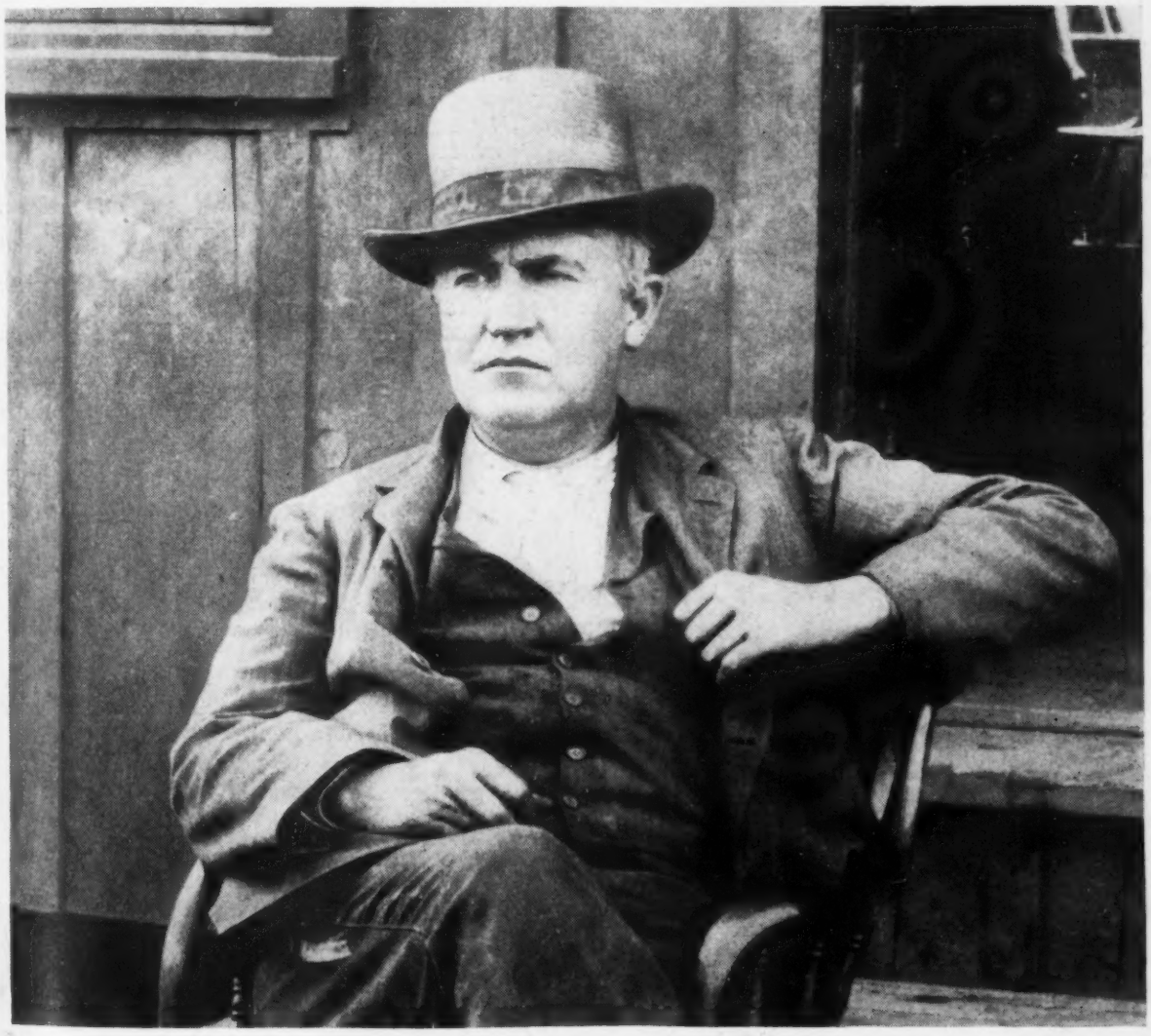
Electrical World

News Issue

FEBRUARY 8, 1947



Thomas A. Edison—Inventor—1847-1931

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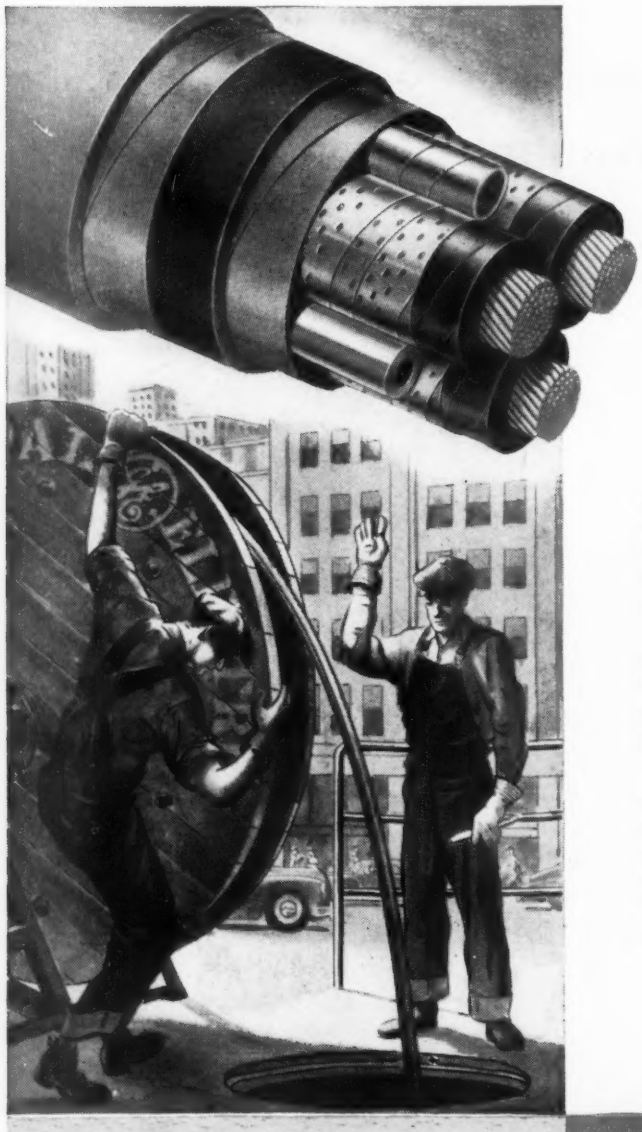
"WE INSTALLED G-E GAS-FILLED CABLE BECAUSE IT'S SELF-SUPERVISING AND SELF-HEALING"

H. W. CLARK
Ass't Engineer of Distribution
Potomac Electric Power Co.



HERE is cable that's self-supervising to give lower operating costs, self-healing to give better service continuity.

Mr. Clark, Engineer of Potomac Power, says: "One of the principal reasons for our selection of G-E gas-filled cable on a 10-mile 33-kv line was its self-healing and self-supervising feature. If the sheath is damaged, an alarm sounds warning, and we can feed reserve gas into the cable and wait until the load goes down before we repair it."

Gas-filled cable automatically gives your maintenance department the jump on outages. At the first signal of a leak a pressure relay operates an alarm. Compared with solid cables, which fail completely before warning of damage, resultant savings from early repairs may be as great as $1000 to $1500 each time the alarm sounds.

In addition, G-E gas-filled cable is self-healing under stress. Valving additional gas into the system acts to keep voids filled, suppresses ionization, and prevents penetration of moisture until a time when repair is practical.

With this combination self-supervising and self-healing feature, we believe that gas-filled cable, within its recommended voltage range, will serve profitably in your system. You can obtain more details by calling your nearest G-E office or writing for Bulletin GEA-3652. *General Electric Company, Apparatus Department, Schenectady 5, New York.*

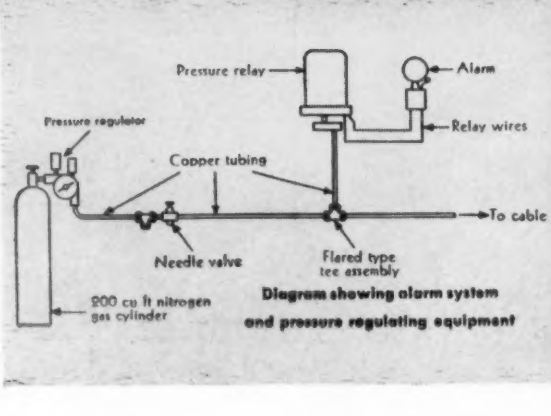


Diagram showing alarm system and pressure regulating equipment

Normal operating pressure of the pure, dry, inert, nitrogen is between 10 and 15 pounds per square inch for low-pressure 10-kv to 40-kv lines. On 40-kv to 69-kv lines, the medium pressure is 40 pounds per square inch. In the diagram at left, the simplicity of the equipment is at once apparent. For GF cable lines up to 40,000 feet, a manually operated regulator and alarm system like this need be used at *but one end.*

GAS-FILLED CABLE

GENERAL ELECTRIC

ELECTRICAL WORLD

VOLUME 127 NUMBER 6

NEWS ISSUE

FEBRUARY 8, 1947

Interior Department Reveals Major Objectives in Report

Aims Include Full Development of Hydro Resources in Far West, Development of Potential Power Projects Elsewhere, and Participation with Other Agencies in Power Planning

STARTING its first full year under the direction of Secretary Krug, the Interior Department has established three major objectives for its future activities in the electric power field. They are:

1. The full development of hydroelectric resources in western states where the Reclamation Bureau, Bonneville Power Administration and Southwestern Power Administration already are engaged in extensive planning, construction, and marketing activities;

2. Development of potential federal power projects in other sections of the country;

3. Participation by Interior, with the Federal Power Commission, the Army Engineers, and other agencies, in the planning of all projects for which the department will be responsible for power marketing.

These aims are outlined in Interior's annual report for the fiscal year ended last June 30. Nearly a quarter of this 447-page document is devoted to the department's power policies and the activities of agencies which handle power operations.

Development and conservation of natural resources in the West "is being definitely held up" through "lack of reclamation land and water, and through power shortages," the report says.

Federal power programs, now in various stages of planning or actual construction, are expected to make substantial additions within the next 20 years to the power capacity of several western regions as well as in other sections of the country. These planned increases in capacity are estimated at 3,700,000 kw. in the Colorado River area, 7,500,000 kw. in the Columbia Basin, 1,800,000 kw. in the Missouri Valley, 1,400,000 kw. in the basins of the White, Red, and Arkansas Rivers, 1,700,000 kw. in California, and 4,700,000 kw. in the Southeast, or a total of about 20,800,000 kw. for the nation.

Since few of the streams being developed for power and other purposes have tremendous volumes of water the year around, as has the Columbia River, Interior faces a problem in producing firm, low-cost public power to stimulate "new industrial growth" in many regions. To secure "full benefits for the region and to prevent waste of resources," the department deems it necessary to have "steam plants tied in with the hydro plants." Steam capacity will be required, the report adds, together with hydro developments on the Arkansas, White, Red and Sacramento Rivers, and in the Southeast in connection with projects now being built by the engineers.

Power Costs Now Higher

The problem of getting low-cost power out of rivers has increased in difficulty because of rises in prices during recent years. "Dams may now cost from 50 to 80 percent more to construct than they did in 1940," it is conceded. In the Southeast the proposed Army dams will produce power at costs ranging from 5 to 6 mills. The "only other major hydro prospect" in the East, the St. Lawrence seaway, would produce about 13,200,000,000 kw.-hr. annually for the United States and Canada, and this would be "very low-cost energy."

In the Flood Control Act of 1944 and the Rivers and Harbors Act of 1945, Congress gave Interior the responsibility for "marketing and transmitting" power generated at projects constructed by the Engineers. However, planning for flood control and navigation dams remains with the Engineers, and the Federal Power Commission makes the studies of prospective power markets and recommends the power installation for Army developments. Thus, Interior, which must market the power, does not "control the many factors which are involved in its cost."

To assure "the most efficient over-all job" of selling federal power, the report read, Interior should participate actively in 1. Original preliminary studies, 2. Selection of projects, 3. De-

The Cover Picture

To the present generation, Thomas Edison is a benign, white-haired figure, full of years and wisdom, as pictured inside this number of *Electrical World*, which celebrates the hundredth anniversary of the great inventor's birth. It was not that tired-appearing old man who, by genius and diligence, placed so many of the foundation stones on which today's electrical industry is built. It was rather the man in working clothes, here seated at the door of his shop. Vigorous of mind and body, his eyes hold his characteristic look of unseeing concentration.

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termining the size and character of electrical facilities, 4. The "timing" of submission of authorization bills to the Congress, 5. Establishing allocations of costs, 6. Setting up accounting and repayment schedules, and 7. Determining the timing of installation of power facilities. Interior also should be responsible for operating the power equipment.

Interior has given "particular attention" to six projects being built by the Army in the Southeast for which funds have been appropriated. These projects will have an ultimate installed capacity of 1,057,000 kw. Plans are under way "to propose to the Congress" the establishment within the department of a marketing agency for the Southeast similar to SPA and BPA.

An interesting phase of the report is its comment upon Secretary Krug's recent endorsement of the establishment of a Columbia Valley authority. It notes that "the Secretary has come to the conclusion that when the people of the basin are eventually ready to support it, some form of river basin administration . . . is essential." But this bureau "will coordinate," rather than "supersede all the other agencies" now engaged in developing the region.

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Central Maine Power Co. to Redevelop Saco Hydro

Central Maine Power Co. directors have authorized redevelopment of the company's hydroelectric plant at Union Falls on the Saco River about 8 miles above Biddeford, the estimated cost being $3,700,000 exclusive of the site already owned. The present station at Union Falls is rated at about 812 kva.

Two 8,400-kw. General Electric generators and two S. Morgan Smith turbines have been ordered, and President W. B. Skelton states that it is estimated that the redevelopment will yield approximately 75,000,000 kw.-hr. annually additional.

The new installation, 20 times the capacity of the old, will be close to heavy load centers in the southern portion of the company's territory and will enable more effective use to be made of the Saco River. Many engineering details of the project remain to be worked out.

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U.W.U. Gets Recognition

Utility Workers Union of America, C.I.O., has been certified by the National Labor Relations Board as the bargaining agency for production and maintenance employees of the Potomac Edison Co. at Cumberland, Md.

MEDALIST—Vannevar Bush holds the Hoover Medal which he received at the A.I.E.E. winter meeting

Utility Hires Consultants for New Cooperative Plant

Iowa Electric Light & Power Co., which will operate the power plant to be built by the Central Iowa Power Cooperative, has retained Dr. A. G. Christie, Department of Mechanical Engineering, Johns-Hopkins University, to consult with Kenneth R. Brown, engineer for the co-op, regarding the mechanical design of the new plant.

Other consultants will be Dr. A. E. White, head of the Department of Engineering Research, University of Michigan, metallurgical problems; Dr. Frederick G. Straub, Department of Chemistry, University of Illinois, boiler feed water problems; and Dr. M. S. Coover and Dr. A. E. Bost, Iowa State College. electrical problems.

Mrs. M. S. Coover Improving

Mrs. M. S. Coover, wife of Prof. M. S. Coover, head of the Department of Electrical Engineering at Iowa State College and a former vice-president of the American Institute of Electrical Engineers, is improving each day and is out of danger.

Mrs. Coover is in St. Vincent's Hospital, Seventh Ave. and 11th St., New York City, where she was taken on January 26, after being injured by the falling body of a man who leaped from the top of the Empire State building. She was in New York with her husband to attend the winter meeting of the A.I.E.E.

New Priorities Regulation Aids Utilities Buy Surplus

Establishment of a new procedure under which public utilities and building contractors may certify themselves for priorities to buy certain types of surplus property was announced last week by Housing Expediter Frank R. Creedon. The new priority regulation (HEPR-7) gives utilities and other qualified bidders a limited priority status—just ahead of the general public—in sales of surplus at government installations.

The new order, which was requested at the recent conference of utility and federal disposal agency representatives in Washington (ELECTRICAL WORLD, December 21, 1946, Page 52), modifies previous regulations of the housing expediter aimed at channeling additional surplus property into the Housing Program.

As provided by the previous orders, qualified utilities and building contractors receive priority ratings below the following groups, as provided by the Surplus Property Act: 1. Government agencies; 2. Reconstruction Finance Corporation for sale to small business; 3. State and local governments; 4. Nonprofit organizations.

Qualifications for the new priority are less stringent than the old requirement that all surplus obtained had to be put directly into a veterans housing project. The new regulation qualifies any utility which will use the desired surplus for "construction or maintenance of utilities . . . necessary to service" veterans housing or to replace "equivalent materials" used for housing. Surplus obtained by a "self-certifier" and not used by him must be resold to other priority users for housing purposes.

Surplus purchasers may qualify as "self-certifiers" by submitting with their bids a written certificate, which must be "substantially" as follows:

"The undersigned certifies to the U. S. Government, subject to the criminal penalties of Section 35 (A) of the U. S. Criminal Code, that (1) he is eligible under HEPR-7 to purchase the structures and utilities (or materials) covered by this bid, and (2) he will use or sell the materials derived from the structures and utilities in accordance with that regulation."

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New Chairman Named

Under the rotation policy of the Virginia Corporation Commission, H. Lester Hooker has succeeded L. McCarthy Downs as chairman.

I.B.E.W. President Answers NEMA Charges of Boycotts

Dan W. Tracy Denies Union Practices Secondary Boycott and Accuses R. Stafford Edwards, NEMA Head, of Trying to Influence Congress to Do What Courts Would Never Do

[Editor's Note—At the invitation of ELECTRICAL WORLD, the International Brotherhood of Electrical Workers, A.F.L., has made the following comment on an article published in these pages on January 18, Page [27].

"The International Brotherhood of Electrical Workers stands ready to debate the allegation made by the National Electrical Manufacturers Association that the I.B.E.W. engages in so-called secondary boycotts, if NEMA will agree to debate the effects of secondary boycotts practiced by the NEMA against union products," Dan W. Tracy, international president of the International Brotherhood of Electrical Workers, said this week.

"I am perfectly safe in making this offer," Tracy said, "knowing as I do that I.B.E.W. is not engaged in fact, or in legal theory, in operating secondary boycotts, and knowing as I do that NEMA will not abandon its customary tactics against competitors."

Remarks Prompted by Edwards

Tracy's remarks were prompted by the announcement of R. Stafford Edwards, president of NEMA, to the effect that "the industry calls upon Congress to outlaw all forms of secondary boycott." He added:

"In reality what NEMA, as depicted by R. Stafford Edwards, is trying to do is to cajole Congress into interpreting labor's rights—God-given, inherent and legal—into secondary boycott. Edwards is seeking, by 'hue and cry,' to get Congress to do what NEMA could never get the courts to do."

The truth is, Tracy said, Edwards is seeking to eliminate competitors by Congressional edict. I.B.E.W. has contracts with 721 electrical manufacturing associations. Some, but not all, of these are members of NEMA.

I.B.E.W. is engulfed in the business of dealing amiably with these 721 firms and with supplying them with the union I.B.E.W. label with no competitive disadvantage to any one.

"A union label is granted the same sure protection as trade marks, the United States Patent Office recently ruled," Tracy asserted. "Union labels are used as a positive factor of good will and assurance of good quality products resulting from good workmanship under satisfactory working conditions, in the assumption that members and friends of labor organizations will purchase such goods in preference to similar goods without identifying marks.

"I.B.E.W. is not acting contrary to law when its members refuse non-union made materials. They are merely exerting a legal right to exercise a preference in purchase."

Tracy asserted that Edwards is trying to "trick Congress" into broadening "the commerce clause of the Constitution at the expense of the Bill of Rights."

"The I.B.E.W. worker is a craftsman. He has spent years in the study and pursuit of his trade. He is entitled by every law to exercise lawful means to protect that trade against the usurper, the unqualified, and the mechanical substitute. His position is no different from the doctor whose power through the American Medical Association secures passage of legislation protecting his profession against the quack, the unlicensed, and the patent medicine. Nor is the electrical craftsman different from the lawyer who, in order to safeguard his years of study, must continually take steps to prevent the over-night labor relations adviser, the banks, and a score of others untrained in the law, from encroaching upon and destroying his profession. The comparisons are identical and likewise apply to members of the NEMA. Labor asks no privileges but will defend its rights. However, Edwards would have one law for the masters and one for the men."

•

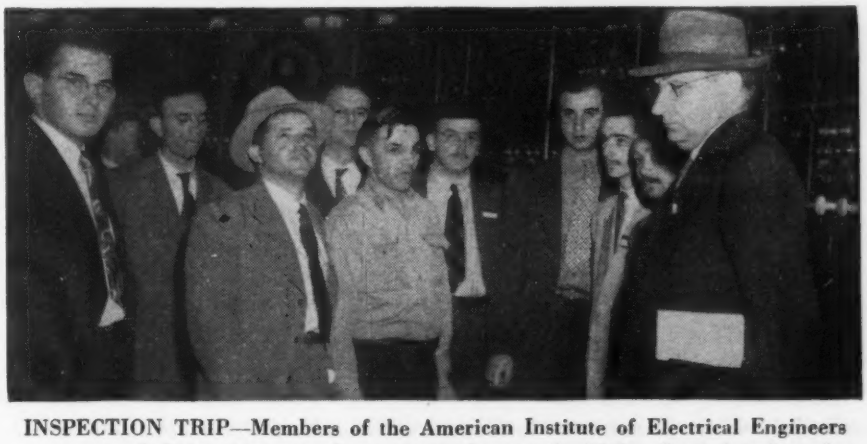
Government May Buy Salt River Association System

Purchase by the government of irrigation and hydroelectric dams and power facilities of the Salt River Valley Water Users' Association in central Arizona is contemplated in negotiations under way between the Interior Department and association officials. The purchase plans, which are reported near completion, will be subject to approval by the Congress.

Culminating nearly two years of negotiations, representatives of the association and high Interior officials recently reached agreement "on all major points" of the proposed transfer of the properties to the Bureau of Reclamation. Under present arrangements, the Bureau would take over all facilities, except those for the distribution of irrigation water and electric power. Reclamation would operate the association's power transmission lines, however.

Though Interior and Salt River spokesmen insisted that the association's financial status was sound and that the negotiations did not represent an effort by the government to "bail out" the Phoenix, Ariz., irrigationists, they admitted that the association was "seriously handicapped" by a heavy bonded indebtedness as a result of investment in its several irrigation and power plants. The association also is the defendant in a several-years-old suit of the government involving nonpayment of federal taxes.

Salt River currently operates eight hydroelectric plants with a rated ca-



INSPECTION TRIP—Members of the American Institute of Electrical Engineers as a part of their winter meeting program inspect the high voltage board at the Waterside station of the Consolidated Edison Co. of New York

pacity of 70,950 kw. Most important of these plants are located at the Roosevelt, Horse Mesa, Mormon Flat and Stewart Mountain dams. The association also owns a diesel (10,000 kw) and steam generating plant (22,500 kw.) at Tempe, and 1,960 miles of transmission and distribution lines. It operates the Bartlett and Cave Creek reservoirs solely for irrigation and flood control, although the former is so constructed as to permit future installation of power generating equipment.

Noting that power operations of the association plants were considerably curtailed during recent months because of the shortage of water in Central Arizona, Reclamation officials said they were prepared to bring energy from their Colorado River plants—Parker and Davis Dams—into the region when, and if, the Salt River facilities are purchased. Though transfer of the properties must be authorized by Congress, little or no funds will be sought in new appropriations, they said. Receipts from power operations will supply whatever funds are necessary to close the deal, these spokesmen added.

Reclamation may not convert the 25-cycle facilities of the Salt River hydroplants to conform with the 60-cycle equipment of its Colorado River projects. One plan being considered by Interior power engineers calls for maintenance of the present facilities of the four major association plants to supply energy to nearby copper mines and other distribution systems built for 25-cycle operation. In such event, the smaller hydro projects—at the Cross Cut, South Consolidated, Arizona Falls and Chandler plants—might be retired. The steam and diesel plants are easily adaptable to 60-cycle operations, the engineers reported.

A.I.E.E. Wants Engineers Exempt from Wagner Act

Directors of the American Institute of Electrical Engineers have empowered their president to help "bring about a revision of the National Labor Relations Act which will secure for engineers freedom of choice in the matter of collective bargaining."

The action, taken January 30 at a directors' meeting following the association's annual winter meeting, was A.I.E.E.'s first venture into the field, which had been penetrated earlier and farther by several other engineering societies.

To implement the grant of authority, President J. Elmer Housley appointed C. W. Ransom, of the Institute's Pittsfield section, as his personal representative and A.I.E.E.'s representative on a panel of the Engineers Joint Council. The panel is now scheduled to testify early this month before a Congressional committee which will consider revisions of the Wagner Act proposed by Senator Ball, Minnesota Republican.

Thus far, no action has been taken under the A.I.E.E. resolution other than the Ransom appointment. It is believed likely that the E.J.C. panel may testify on other labor legislation which might affect the status of engineers, including a bill to be introduced this week by Rep. Hinshaw, California Republican.

In a statement this week, Housley asserted that A.I.E.E. "now stands ready through its president to collaborate with other organizations or individuals seeking to establish engineers as a professional group outside the provisions and interpretations of the Wagner Act."

Housley added that it is "highly desirable to avoid any coercion either pro or con insofar as the engineer is concerned and to establish for the engineers an independent professional status leaving him free to choose his own course of action free of coercion from any group."

The A.I.E.E. directors' resolution differed from that suggested to the association by E.J.C. and was adopted after considerable discussion which culminated in the decision to leave the matter in the hands of the president.

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Alabama Utilities Asked to Quit Selling Appliances

Electric and gas utilities in Alabama have been asked by the Public Service Commission to consider the advisability of quitting the appliance business.

In a letter to President Thomas W. Martin, Alabama Power Co., the commission stated that numerous complaints have been received from appliance dealers claiming it is "unfair competition for the utilities to be in the merchandising business."

One complaint is that the utilities get the first opportunity to sell to prospective customers because newcomers have to sign for service, thus making their names available.

The commission pointed out that the utilities have an advantage in being able to absorb the "greater part" of the cost of billing and collecting on installment sales by adding the account to the customer's regular gas or electric bill.

Another objection is that some utilities have shown a "very substantial" loss at times from the sale of appliances which is reflected as an additional burden on the rate payers of the company.

PRESIDENT AND VICE PRESIDENTS—Elmer Housley, Aluminum Co. of America, president of the American Institute of Electrical Engineers, poses with eight of the ten vice-presidents following a board of directors meeting last week in New York. Front row, left to right, O. E. Buckley, Bell Telephone Laboratories; L. M. Robertson, Public Service Co. of Colorado; T. G. LeClair, Commonwealth Edison Co. of Chicago; President Housley; E. W. Davis, Simplex Wire & Cable Co.; F. L. Lawton, Aluminum Co. of Canada; F. F. Evenson, consulting engineer, San Diego, Calif.; standing, R. F. Danner, left, Oklahoma Gas & Electric Co.; H. B. Wolf, Duke Power Co.

Over Half of Nation's Farms Use Electricity, REA Reports

Fiscal 1946 Statement Shows 856 Co-ops Serving 1,549,057 Customers—2,185,150,000 Kw.-Hr. Sold for $34,169,000—Industry Demand Increases—70 Co-ops Purchased Systems

RURAL ELECTRIFICATION passed the halfway mark during the fiscal year ended June 30, 1946, with nearly 53 percent of the nation's 6,000,000 farms receiving electric service, according to the Rural Electrification Administration's annual report.

Of REA's 996 borrowers, the 856 with systems in operation during fiscal 1946 were serving 1,549,057 consumers, an increase of 261,710 over the previous year. These systems distributed a total of 2,185,150,000 kw.-hr. of energy, an increase of 119,028,000 over 1945 distribution.

REA-financed systems purchased 2,401,433,000 kw.-hr. from other systems, or 137,668,000 more than in 1945. Their generating plants produced 283,519,000 kw.-hr., as compared with 229,258,000 during the previous fiscal year.

Operating revenues increased from $68,152,000 in fiscal 1945 to $80,275,000 in 1946, and operating expenses, from $38,983,000 in 1945 to $46,106,000 last year. Gross income increased less sharply, from $29,169,00 to $34,169,000.

50,000 Miles of Line Energized

Approximately 50,000 miles of line were energized in the fiscal year, bringing the total miles of line operated by REA borrowers to 474,837. During the year 70 borrowers acquired existing power systems or portions of systems, including facilities serving 24,359 consumers along 2,855 miles of line. Total base purchase price of these acquisitions was $7,393,359.

Growth of local industries in areas served by REA-financed systems was evidenced during fiscal 1946 by the number of industrial and commercial power purchases, the report shows. REA systems received applications for installations of 321 manufacturing and processing power loads, with a total demand load of 27,695 kw. These figures compared with the 183 applications with demand load of 12,573 kw. during 1945. The largest number of these applications came from processors and preservers of agricultural products. REA borrowers also were serving an estimated 20,000 rural schools.

Opposition to the REA program continued, the report added, taking the form of "spite line" construction by power companies, efforts by the companies to buy out co-op systems—successful in two cases—and speeches and articles by utility spokesmen attacking REA's activities.

Congress appropriated $300,000,000 for REA loans during the fiscal year, more than half the total amount loaned by the agency during the previous ten years of its existence. REA approved loans totalling $288,672,966 from these funds but actually advanced only $87,253,106 to borrowers during the year. However, the agency had on hand applications for loans totaling $208,000,000 at the close of the fiscal year.

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Sues for Tax Refund

A refund of $552,393.44 in excess profits taxes and interest is being sought by the Louisville Gas & Electric Co. in a suit filed in federal court against Seldon R. Glenn, Internal Revenue Collector.

The petition charges the money was illegally collected in November, 1945, "because of erroneous rulings by the Bureau of Internal Revenue."

California Utility Requests P.U.C. to Regulate Co-ops

In an action said to be the first of its kind in California, the California Electric Power Co., Riverside, seeks to place cooperatives formed under the Rural Electrification Administration within state jurisdiction.

The company has filed with the California Public Utilities Commission a 46-page brief in support of a petition filed in December, asking that the commission take immediate jurisdiction over the Mesa Electric Corporation, Inc., and prohibit that cooperative from proceeding with the erection of poles for a power line.

After the commission held a hearing but took no action, Cal Electric's brief was filed January 9. It was sharply critical of what it termed the bureaucratic policies of REA and other governmental agencies. It contended that REA is not so much concerned with getting electricity to persons in rural areas as it is with getting it to them through REA.

The utility asserts specifically that the Mesa Electric co-op is putting up poles in the Victorville area to serve scattered communities and that these communities are the same that demanded service from the utility more than a year ago, insisting that if some 200 miles of line were not built immediately, they would do it themselves.

Cal Electric contends there is no need for the co-op's line because their main lines go through the area and that plans are completed for development soon.

E. F. McNaughton, public adviser on the commission, said the case would probably be taken to court as a test case.

EDISON MEDAL PRESENTATION PERSONALITIES—David Sarnoff, left, president of the Radio Corp. of America, who presented Lee de Forest for the Edison Medal which he received from A.I.E.E. president J. Elmer Housley. S. M. Dean, chairman of the awards committee, is at the right

SEC RULINGS

The Securities and Exchange Commission recently issued a series of orders affecting electric utility companies.

PUBLIC SERVICE CO. OF INDIANA, INC., and its subsidiary, Indiana Gas & Water Co., and its parent, Middle West Corp., have received commission approval for a series of proposed transactions. Public Service proposes to dispose of substantially all of its common holdings of Indiana Gas by declaring dividends from time to time on its common, payable in common of Indiana Gas, with scrip certificates in lieu of fractional shares. Indiana Gas plans to amend its charter in order to provide for the issuance of scrip certificates representing fractional share interests in its outstanding common, all of which is owned by Public Service. It will also issue from time to time bearer scrip certificates in exchange for their equivalent in shares of its common to be surrendered by Public Service. Middle West proposes to acquire from time to time shares of common of Indiana Gas (or scrip certificates representing fractional shares) to which it may be entitled by reason of its ownership of 224,586 shares, approximately 20.27 percent of outstanding common stock of Public Service. (Release No. 7138).

NEW JERSEY POWER & LIGHT CO.'s proposal to sell its gas utility properties to three newly formed New Jersey corporations for $361,000, plus certain closing adjustments, has been approved. The purchasers, which were formed by Rena R. Carver, Calvin R. Carver and Doris C. Fearon, are City Gas Co. of New Jersey, City Gas Co. of Phillipsburg, N. J., and City Gas Co. of Newton, N. J. (Release No. 7144).

NORTHERN STATES POWER CO.'S (DEL.) motion, requesting that the commission vacate that portion of its order of November 8, 1946, directing the holding company to terminate its existence and proceed promptly to submit a plan of liquidation has been denied. Northern States' supporting brief had contended that the entry of the section 11 (b) (2) order was "improper at this stage of the proceedings." (Release No. 7148).

STANDARD GAS & ELECTRIC CO.'s proposal to sell all 750,000 outstanding shares of $20 par value common stock of Oklahoma Gas & Electric Co., a subsidiary, and the latter's proposal to sell an additional issue of 140,000 shares of the security have been sanctioned. In both instances the stock will be offered at competitive bidding and, complying with requests made by the companies, the commission shortened the usual ten-day notice period for inviting bids to six days so as to minimize the possibility of the postponement of the opening of the bids due to a change of market conditions. (Release No. 7149).

WASHINGTON RAILWAY & ELECTRIC CO. has received authority to issue and sell $2,800,000 principal amount of bank loans and to apply the money plus $700,000 treasury funds to retirement of all its $3,500,000 presently outstanding bank loans. The new bank loans will be issued to the same banks which now hold the outstanding loans. (Release No. 7151).

GENERAL PUBLIC UTILITIES CORP. has been given until May 1 to dispose of 1,800 shares of the $50 par value, 5 percent cumulative preferred stock of South Caroline Electric & Gas Co. General acquired 2,930 shares of South Carolina's preferred upon the dissolution of General Gas & Electric Corp., a subsidiary of General Public Utilities and parent of South Carolina. In sanctioning the acquisition of these shares last September, the SEC stipulated that General had to dispose of the securities on the New York Stock Exchange. To date, the company has sold 1,130. (Release No. 7156).

WESTINGHOUSE SCIENTIST HONORED—Dr. Lewis W. Chubb, left, director of the Westinghouse Research Laboratories, receives the John Fritz Medal from Nevin E. Funk, vice-president of the Philadelphia Electric Co., at the A.I.E.E. winter meeting

Westinghouse Police Told to Select Bargaining Agent

A bargaining election among police guards in the Westinghouse Electric Corp.'s South Philadelphia Works at Lester, Pa., has been directed by the National Labor Relations Board.

All police guards below the rank of sergeant will vote on whether they wish to be represented, in a separate unit, by the C.I.O. United Electrical Radio & Machine Workers, which now represents a unit of production and maintenance workers.

NLRB followed its Monsanto Chemical decision in rejecting Westinghouse's contention that the police guards, having monitorial duties, were not employees within the meaning of the Wagner Act. The Board refused to include the guards in the same bargaining unit as the production and maintenance workers, which the union requested.

Westinghouse had signed an agreement with the C.I.O. union covering the same police guards in November, 1945, but last March 31 refused to renew it until the NLRB certified the union as bargaining agent.

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St. Louis Awards Contract

The St. Louis Board of Public Service has awarded a ten-year contract to the Union Electric Co. of Missouri for electricity to light the city's streets and public buildings. The annual cost will be $482,335 as compared with $514,000 under the former contract. Annual consumption is 41,000,000 kw.-hr. After five years St. Louis can cancel the contract if it desires to produce its own electricity.

MEETINGS

National Adequate Wiring Bureau—Annual Adequate Wiring Forum, Hotel Stevens, Chicago, February 27-28. O. C. Small, secretary, 155 East 44th St., New York 17, N. Y.

Previously Listed

Edison Electric Institute—Transmission and Distribution Committee, Atlanta Biltmore Hotel, Atlanta, Ga., February 10-11; Meter Committee, Robert Treat Hotel, Newark, N. J., February 10-12; Electrical Equipment Committee, Atlanta Biltmore Hotel, Atlanta, Ga., February 12-13; Annual Sales Conference, Edgewater Beach Hotel, Chicago, March 31-April 3.

Association of Edison Illuminating Companies—Committee on Metering and Service Methods, joint meeting with E.E.I. Meter Committee, Robert Treat Hotel, Newark, N. J., February 10-12.

Pennsylvania Electric Association—Systems Operation Committee, Lord Baltimore Hotel, Baltimore, Md., February 13-14. Electrical Equipment Committee, Penn-Harris Hotel, Harrisburg Pa., February 20-21. Transmission and Distribution Committee, Penn-Harris Hotel, Harrisburg, Pa., February 20-21.

Great Lakes Power Club—Meeting, Palmer House, Chicago, February 14.

American Society for Testing Materials—Spring meeting and committee week, Benjamin Franklin Hotel, Philadelphia, Pa., February 24-28.

American Society of Mechanical Engineers—Spring meeting, Mayo Hotel, Tulsa, Okla., March 2-5.

National Electrical Manufacturers Association—Spring meeting, Edgewater Beach Hotel, Chicago, March 3-5.

Canadian Electrical Association—Western conference, Hotel Vancouver, Vancouver, B. C., March 3-5.

Institute of Radio Engineers—National Convention, Hotel Commodore, New York, March 3-6.

Radio Engineering Show—Grand Central Palace, New York, March 3-6.

Midwest Power Conference—Palmer House, Chicago, March 31-April 2.

Southeastern Electric Exchange—Spring Conference of the Engineering and Operation Section, Sheraton Bon Air Hotel, Augusta, Ga., March 20-21.

SPA Rewrites '48 Budget; Estimates Add $1,400,000

$2,000,000 Item for Purchase of Lake Catherine Substation Dropped Entirely from Budget

The Southwestern Power Administration's construction budget for fiscal 1948 has been completely rewritten by supplementary estimates submitted to Congress on February 3, by President Truman. The new estimates added $1,400,000.

The unprecedented revision of the SPA budget, which was cleared by both the President and the Budget Bureau, came in the midst of House subcommittee hearings on annual appropriations for all Interior agencies. Original estimates of SPA's 1948 construction expenditures, as presented in the President's annual budget message (ELECTRICAL WORLD, January 11, Page 3), were reshuffled as follows:

1. An item of $2,000,000 for purchase of a portion of the Ark-La transmission line and the Lake Catherine substation was dropped entirely.
2. Added were new items of $1,750,000 for substations and a switching station, and $975,000 for feeder lines.
3. Expenditures for "general plant and equipment" were boosted from $200,000 to $525,000, and an item of $100,000 for administration, engineering, and general expenses was increased to $450,000.

Only one construction estimate, $25,000 for future plans and specifications, remained unchanged. Also untouched were the original Budget Bureau estimates of $200,000 each for SPA's operation and maintenance and the continuing fund for emergency expenditures.

Substations Planned

Administrator Douglas G. Wright explained that if Congress approves the additional funds, SPA plans to build the substations and switching station on the transmission line between Denison and Norfork dams. The agency received an appropriation for this line during the last session of Congress.

One substation, costing an estimated $750,000, would be located at Tulsa and would permit connections with the systems of the Public Service Co. of Oklahoma and the Grand River Dam Authority. The other substation would be built at Ada, Okla., with possible take-offs to the Oklahoma Gas & Electric Co. system and SPA feeder lines. The switching station would be installed at Weleetka, Okla., with tie-ins with the Public Service Co. and Southwestern Gas & Electric Co. Cost of the latter two projects is estimated by SPA at $500,000 each.

LILIENTHAL TESTIFIES—David E. Lilienthal, seeking confirmation as chairman of the Atomic Energy Commission, testifies before Congress' Joint Atomic Energy Committee. At the bench, left to right, are Rep. Melvin Price, Illinois Democrat; Sen. Kenneth McKellar, Tennessee Democrat (not a committee member); Sen. Edwin Johnson, Colorado Democrat; Sen. Brian McMahon, Connecticut Democrat; and Sen. Bourke B. Hickenlooper, Iowa Republican, committee chairman

Plans for several feeder lines are contemplated by SPA. Among these is a line running from Fort Gibson through northeast Arkansas to the towns of Bentonville and Siloam Springs. Others would extend from Ada to the Oklahoma towns of Duncan and Marlow, and Lindsay and Purcell.

•

Unfavorable Cody Report Given Approval by Krug

Secretary of the Interior J. A. Krug has approved a report submitted by the Bureau of Reclamation which is unfavorable to construction at this time of the Cody dam and power plant on the Shoshone River, Wyo.

Development of the Shoshone irrigation project will reduce the flow of water at the proposed Cody damsite to a point where generation of any substantial amount of firm power would not be feasible, bureau engineers said in the report. Power revenues over a 50-year period would equal less than 54 percent of costs on the project.

The investigation was financed in part with funds advanced by the City of Cody, location of the proposed power development, and the Wyoming State Highway Commission.

•

Can Serve Big Industry

Clark County, (Wash.) Public Utility District, has signed a new contract with the Bonneville Power Administration which specifies that the P.U.D. may serve a new industry which buys electric power up to 20 percent of the P.U.D.'s maximum demand load, or to 2,000 kw., whichever is greater.

Utilities Merger Approved by Washington Department

Merger of the Pacific Power & Light Co. and Northwestern Electric Co. has been approved by the Washington State Department of Public Utilities. Both companies have been controlled since 1925 by the American Power & Light Co. The merger is expected to lead eventually to absorption of the Washington Water Power Co. of Spokane.

Pacific Power & Light serves Benton, Columbia, Franklin, Garfield, Grant, Kittitas, Klickitat, Walla Walla and Yakima Counties in Washington and scattered sections in northeastern Oregon. Northwestern Electric serves Portland and adjacent areas in Oregon, as well as Clark and Skamania Counties in Washington.

The merger involves no change in the physical integration or interconnection of the two companies, as they have treated their operations as those of a single company since their affiliation in 1925.

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Better Service Ordered

The New Mexico Public Service Commission has held that the Cuba Light & Power Co., which serves the town of Cuba, has "failed and neglected" to render "adequate, efficient and reasonable service" to consumers. H. L. Weise, proprietor of the firm, was ordered to make necessary repairs and purchase necessary equipment so as to render such service. The commission set March 1 as deadline for compliance with the order, and directed Weise to submit monthly reports.

NEWS ABOUT PEOPLE

H. B. Munsell Elected Head of Kansas City Utility

H. B. Munsell, vice-president and secretary of the Kansas City Power & Light Co., Kansas City, Mo., was elected

H. B. MUNSELL

president of the company at a special meeting of the board of directors, succeeding the late Chester C. Smith.

H. H. Kuhn was elected ranking vice-president of the company and Robert A. Olson, legal representative of the United Light & Railways Service Co., will go to Kansas City from Chicago to succeed Mr. Munsell as secretary. At his own request, R. J. Clark, formerly treasurer, was relieved of active duty with the Kansas City company and will be succeeded by Frank P. Clark.

The new president is a graduate of the University of Iowa School of Law and served as legal representative of four holding companies with headquarters in Chicago prior to going to Kansas City. United Light & Railways Co. is the parent company of the Kansas City property with other interests in seven Kansas, Missouri and Iowa utilities. Prior to his connection in Kansas City, Mr. Munsell worked primarily with financial and regulatory problems under the Holding Company Act with the Securities and Exchange Commission and the Federal Power Commission.

Mr. Munsell is a member of the board of directors of the United Light & Railways Co., the Continental Gas & Electric Corp., the American Light & Traction Co. and the Kansas City Power & Light Co.

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Lincoln Electric Appoints Persons Sales Manager

W. R. Persons has been appointed sales manager of the Lincoln Electric Co., Cleveland, Ohio. Mr. Persons has had a broad variety of sales experience with the company.

Following a brief period in boiler shop fabrication work, he became interested in arc welding and following graduation from the Lincoln Welding School he was sent as a welding demonstrator

W. R. PERSONS

to the company's Pittsburgh office. After some time as a sales and service man in western Pennsylvania, he became district manager at Pittsburgh in 1937. He served in that capacity until his recall to Cleveland for a special post-war planning assignment. From this assignment he was promoted to his new position.

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▶ JAMES F. STUTSMAN has been appointed assistant distribution engineer of the Columbus and Southern Ohio Electric Co., Columbus, in which capacity he will assist with the over-all operations of the distribution department. Mr. Stutsman entered the employ of the company in the distribution engineering department in 1924.

H. S. Marks Made General Counsel for Atomic Board

Herbert S. Marks, war-time member of the power "cabinet" of J. A. Krug in the Office of War Utilities and War

H. S. MARKS

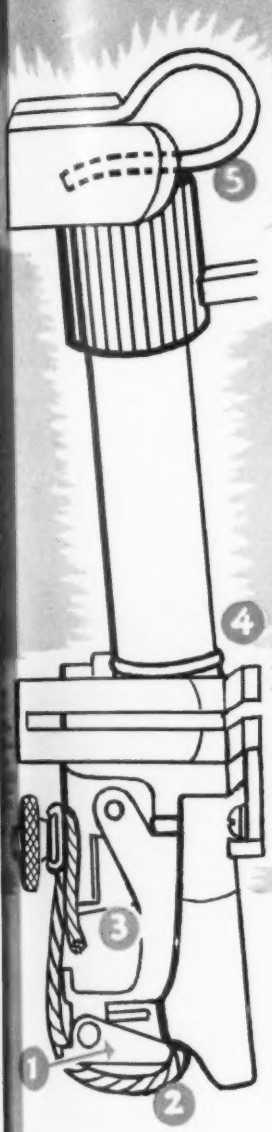
Production Board, has been appointed general counsel for the newly created Atomic Energy Commission.

Mr. Marks has been actively identified with work in connection with both international and domestic control of the atom for more than a year. As special assistant to Under-Secretary of State Dean Acheson, Mr. Marks was one of two non-member consultants who served with the Acheson-Lilienthal Board that wrote the plan for international control of atomic energy which since has become the basis for the U. S. plan before the UN Atomic Energy Commission. Also, he was one of the first three staff advisors retained by AEC when it was activated last fall.

For nearly a year beginning in the fall of 1942, Mr. Marks was chief of the Power Division of WPB, a job to which he was appointed from his position as assistant general counsel of WPB. Through most of the war he was one of a triumvirate of top advisors to Mr. Krug. When the Power Division was enlarged into the Office of War Utilities, Mr. Marks became its counsel.

In his new capacity with AEC, he will again be working with David E. Lilienthal, AEC chairman-designate; he once served as assistant general counsel for

How L-M "PVD" Fuse Cutouts *assure* Positive Vertical Drop



● L-M "PVD" Fuse Cutouts provide instant action in all kinds of weather. Operation is independent of the door . . . working parts are always protected against weather, dirt, and corrosion, because the door always remains closed, even after the fuse has blown.

The indicating feature, easily seen from the ground, saves hunting. This is particularly important when fusing three-phase banks. Re-fusing is quickly done, in one minute, on the pole, even with gloved hands. Or a spare fused "PVD" door is hooked on in six seconds.

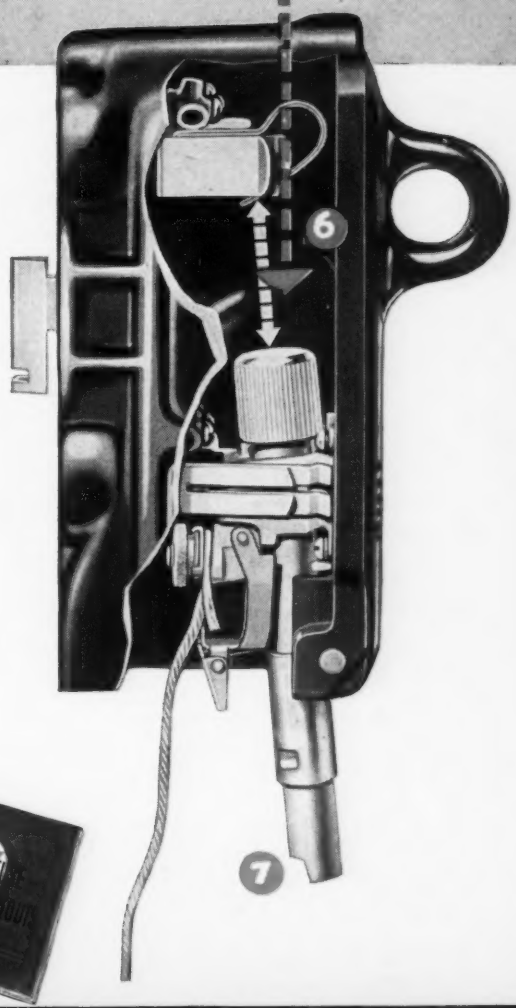
How it Works

Diagram at left shows the working parts. As fuse link blows, link flip-out device (1) snaps out the blown link (2), assuring instant separation of blown link parts before tube can start to drop.

When flip-out device snaps down, it releases latching lever (3) which releases tube (4), permitting it to drop.

Upper contact spring (5) follows tube part way, giving extra time for arc to clear completely inside the tube before contacts separate.

Large air gap between contacts [see illustration at right—(6)] prevents arcing, assures long service for contacts. Cartridge at indicating position (7) is easily seen from the ground—saves hunting, saves time.



Made in Four Sizes

5000 V delta, 50 amps.
75/12500 V Gr. Y, 50 amps.
5000 V delta, 100 amps.
7500/12500 V Gr. Y, 100 amps.

Write for L-M Bulletin 44-101

Details, specifications, applications, of the wide variety of L-M Fuse Cutouts. Line Material Co., Milwaukee 1, Wis.

LINE MATERIAL
FUSE CUTOUTS & FUSE LINKS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters
Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street Lighting Equipment

Tennessee Valley Authority, which Mr. Lilienthal headed before going to AEC.

A graduate of Harvard Law School in 1932, Mr. Marks was secretary to U. S. Circuit Court Judge Mack before going to TVA. He later was general counsel for the Bonneville Power Administration and a member of the legal staff of the Associated Gas & Electric System trustees, from which position he joined the Office of Production Management, predecessor to WPB, in 1941.

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▶ HOWARD F. WEEKS has been appointed director of the editorial department of Consolidated Edison Co. of New York, Inc., succeeding FREDERICK W. CRONE, retired. Mr. Weeks has been assistant director of the department since 1933. Mr. Weeks entered the Consolidated system in 1929 as assistant advertising manager of the Consolidated Gas Co. Mr. Crone had been connected with the Edison system since 1928 and director of the editorial department since 1933. Previously for seven years he was director of the New York State Committee on Public Utility Information.

▶ R. F. GAWRYLA, assistant comptroller of the Pennsylvania Electric Co., Erie, Pa., has been named director of rates and property valuations. Mr. Gawryla joined the Associated system in New York in 1925 and has been with Penelec since 1941.

▶ E. R. MCKEE, professor and head of the department of electrical engineering, University of Vermont, Burlington, and acting dean of the college of engineering, has been named dean of the new college of technology at the university. Professor McKee has been a member of the faculty of the university since 1934.

▶ J. VERNE GONGWER, chief engineer in charge of construction of Tacoma's second Nisqually power development near Tacoma, Wash., has resigned to engage in consulting engineering. Mr. Gongwer has been with Tacoma City Light intermittently for 18 years and also worked for TVA on the Guntersville dam, lock and powerhouse.

▶ GEORGE BRUNZELL has been appointed superintendent of plant, Spokane division, for the Washington Water Power Co. Mr. Brunzell started with Washington Water Power in 1938 and after holding several engineering positions he was made assistant superintendent of distribution, Spokane division, in 1943. In his new position he succeeds the late A. H. Beckwith.

OBITUARY

Chester C. Smith

Chester C. Smith, president of the Kansas City Power & Light Co., Kansas City, Mo., died on January 24 at the age of 58 following a cerebral hemorrhage Mr. Smith had served as president of the company since 1938, joining the staff in 1920 and becoming a vice-president four years later. At the time of his death, Mr. Smith was a member of the board of directors of the United Light & Railways Co. and the Continental Gas & Electric Corp.

A native of Kansas City, Mr. Smith was first employed by the Public Utilities Commission of Kansas City, serving variously as an accountant and later as assistant to the president of the Metropolitan Street Railway Co. in Kansas City. Following service in the Navy in World War I, he became secretary of the Kansas City Power & Light Co. in 1920.

Mr. Smith was active in Kansas City civic circles and was a member of the Missouri Association of Public Utilities, National Association of Manufacturers, Missouri Valley Electric Association, Association of Edison Illuminating Companies and other engineering and business associations.

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▶ RALPH R. BEAL, vice-president in charge of engineering of RCA Communications, Inc., New York, died suddenly on January 24 in Doctors Hospital at the age of 59. Mr. Beal was a pioneer in radio, television and electronics. As research director of the Radio Corp. of America from 1934 to 1943, Mr. Beal was given the responsibility of coordinating research and advanced engineering development activities of RCA and its subsidiaries. When RCA formed a committee in 1935 to study television broadcasting, Mr. Beal was made chairman, a position he held for nine years. During World War II, his activities were devoted almost exclusively to research and engineering dedicated to the war effort. He was a member of the Microwave Committee of the National Development Research Committee of the Office of Scientific Research and Development.

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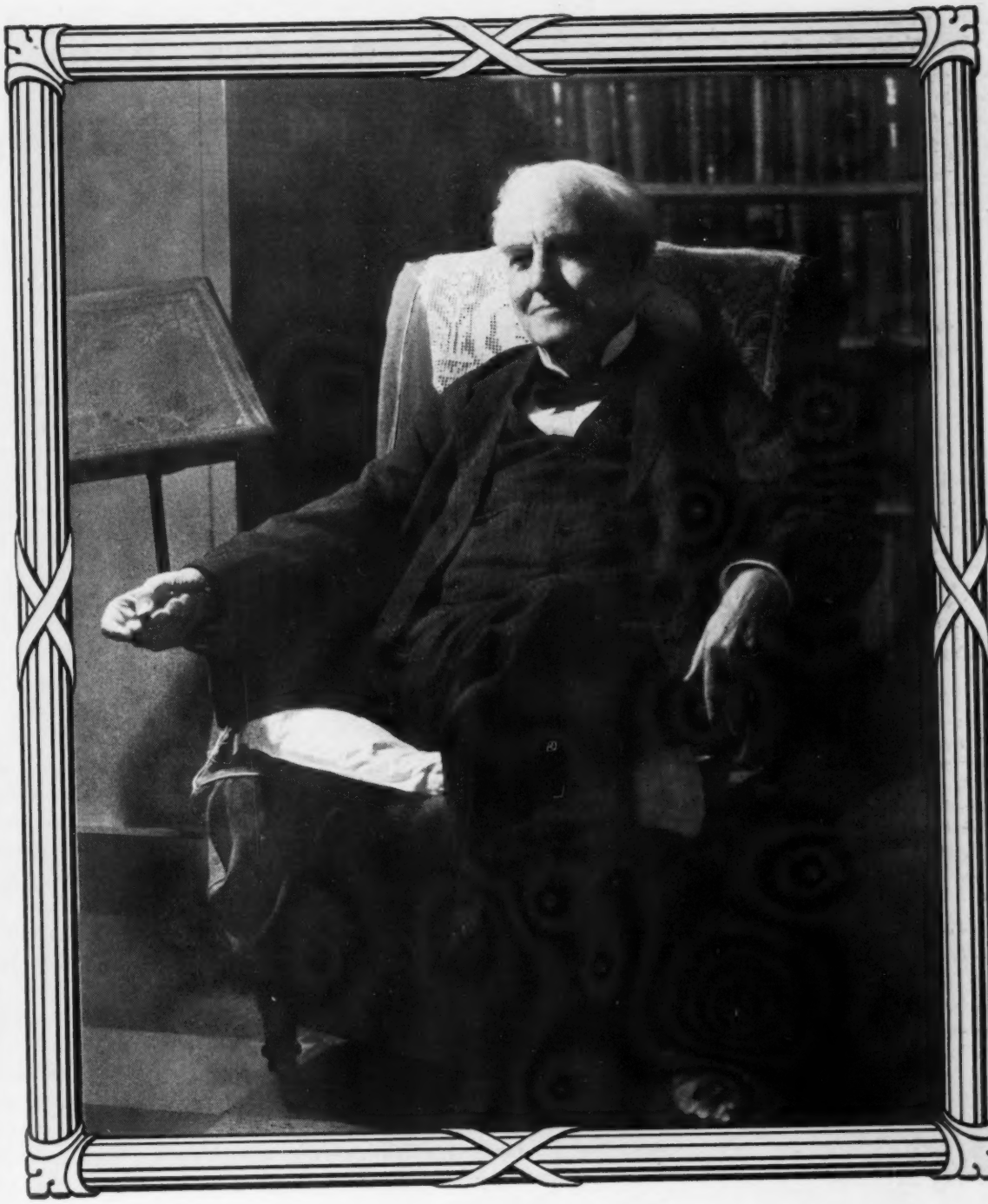
Dr. Charles H. Gyr

Dr. Charles H. Gyr, president and chairman of the board of Landis & Gyr, Inc., electrical manufacturing concern, Zug, Switzerland, died on November 3 in Zug at the age of 67. Dr. Gyr's co-founder and partner, H. Landis, died in 1922 at the age of 43 and from then on the direction and development of Landis & Gyr S. A. was entirely in the hands of Dr. Gyr. He established branch plants in various foreign countries, notably England, France and Germany, and personally developed many of the most important sales agencies abroad, one of which is located on Fifth Av., New York.

In 1929 Dr. Gyr was elected a member of the board of directors of the Swiss Society of Machine Industrialists and in the following year he became president of the Association's group for electrical economy. His creative ideas in these and other professional societies earned him in 1944 honorary membership in the Swiss Electro-Technical Society. In 1936 he accepted a directorship in the "Therma" Factory for Electrical Heating Equipment in Schwanden, Switzerland, and decisively contributed also towards the development of this enterprise. He was, in addition, a director in various other manufacturing companies. For many years and up to World War II, he was active in the development and rehabilitation of the Swiss electric bulb industry.

The part which Dr. Gyr had in the development of not only his own concern, the town of Zug, and the Swiss electrical industry, but also of Swiss economic life as a whole, was expressed in the document by which in 1945 the Swiss Federal Polytechnicum in Zurich, his native city, conferred upon him the title of a Doctor honoris causa "in recognition of his outstanding technical and organizational accomplishments in the development of Landis & Gyr and for the maintenance of its world-wide reputation and, hence, his invaluable services to the Swiss national economy."

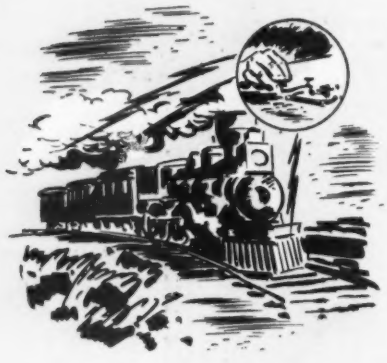
His life-long friend and co-worker, F. Schmuziger, succeeds him in the direction of the enterprise.



Thomas A. Edison Centennial

1847 — 1947

CHRONOLOGY



1847 February 11—Born at Milan, Ohio, son of Samuel and Nancy Elliott Edison.

1859 A newsboy and "candy butcher" on Grand Trunk R.R.

1864 May—First job as regular telegraph operator on Grand Trunk R.R.

1868 Patented first invention, the electrical vote recorder.

1869 Landed in New York poor and in debt; worked for Gold Indicator Co. Established brief partnership with Franklin Pope as electrical engineers; invented Universal stock ticker.

1870 Opened shop in Newark where he made stock tickers and telegraph instruments.

1875 November 22—Discovered electrical phenomenon which he called "etheric force", later recognized as due to electric waves in free space; is foundation of wireless.

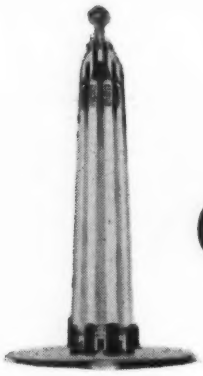
1876 April — Moved to laboratory at Menlo Park. His first laboratory for organized research.

1877 April 27 — Applied for patent on carbon telephone transmitter.

1877 August 12 — Invented phonograph.

1878 September 8—Became actively interested in problem of electric lighting.

1878 October 24 — Incorporation of the Edison Electric Light Company.



THOMAS A. EDISON

Creator of an Era

PORT HURON, Mich., and Okinawa are 8,000 miles and 80 years apart, but the time and distance were spanned by a dachshund's bark.

The dachshund barked first in Port Huron, early in the 1860's, when a country boy asked a Scotch railroad man about the telegraph.

"It's as if you had a dachshund, son, that reached from London to Edinburgh. If you pulled his tail in London, he'd bark in Edinburgh."

The dachshund barked again off Okinawa in the bitter spring months of 1945, when the Navy threw its fantastic proximity fuse into the battle against Japanese suicide planes decimating our fighting ships.

The dachshund's tale inspired the Edison era of electrical invention Starting at Port Huron circa 1860, the trail blazed by Edison has wound through the years. This week, a century after his birth, it stretches endlessly into the future. Thousands of men, many of them great in their own right, have crossed and re-crossed the trail in the intervening years. They played splendid parts in sending the dachshund's bark echoing down the years, but they used the work of Edison.

The parallel isn't unreasonable. Edison's early devotion to telegraphy—learned from a man whose infant son he had snatched from the path of a railroad car—fired his enthusiasm for study and experimentation with electricity. It led to his discovery of the "Edison effect," the *sine qua non* of electronics, the brain of the proximity fuse.

The Edison saga began in 1847 at Milan, Ohio, with the birth of the youngest of seven children to Samuel and Nancy Elliott Edison. It spread to Port Huron, where, in a dozen years, Thomas Edison began his career as a newsboy and candy butcher on the Grand Trunk Railroad. Then the youth became a telegrapher, perhaps because a mobile laboratory succumbed to a rough roadbed, spilling chemicals which ignited a baggage car. Thence burgeoned the greatest career of its era. Perhaps his first invention was the device which automatically reported for him every half-hour on the railroad's telegraph network. This permitted Edison to regain the sleep he lost studying. It was not a success. Its discovery cost him his job.

Equally unsuccessful was his first patent, covering a machine to count and record electrically the "Yeas" and "Nays" cast by legislators. Its failure taught Edison a lesson—never again to invent something without assurance that it was wanted.

It took two years more for Edison to cash the check for a successful

invention—$40,000—for the invention of the Universal Stock Printer.

In 1875 he discovered what he called "etheric force," the phenomenon wherein electric waves traverse an open circuit. This led ultimately to wireless. The next year he set up the first organized research laboratory at Menlo Park.

1877 was a grand year of the Edison saga. In April, he applied for patents on the carbon transmitter, a device which made commercial telephony practical. In August, he invented the phonograph, his favorite invention, and one of his most original accomplishments.

It was a month after the phonograph that Edison became actively aware of what was to prove his greatest invention—the incandescent lamp. This began as an offshot of his attempts to interpolate carbon into electric circuits. The search for practical incandescence evolved from this. To gage the energy required, he carbonized a strip of paper and interposed it between poles of a battery. Incandescence, oxidation and disintegration were almost simultaneous, and the key to the incandescent electric light had been found.

Oxidation, of course, demanded a near vacuum. A hand-operated air pump worked well enough to give an eight-minute life to another carbonized paper filament. Then came powdered glass to prevent oxidation—unsuccessful. Such infusible metals as ruthenium, boron, and chromium were tried, both as separators between carbon points and directly in the circuit. Powdered silicon in glass tubes was another experiment. They worked—but not well enough. The need, then, lay in a more nearly complete vacuum.

In August, 1879, he found a pump which would produce a vacuum up to about one-hundred-thousandth of an atmosphere. A month later he could achieve about one-millionth of an atmosphere, a feat made possible by his perfection of a one-piece glass globe which would retain a high vacuum indefinitely. Having made his tools, he perfected a platinum-iridium lamp only to realize its impracticality. Again he returned to carbon.

It was on October 21, 1879, that Edison carbonized a piece of cotton thread, in the shape of a horseshoe, sealed it into a one-millionth atmosphere vacuum and passed a current through it. Forty hours later, man had burned out his first light bulb.

Having achieved what is perhaps the most basic use of a kilowatt-hour, Edison had to develop the remainder of the system needed to let everyone use it. Edison's next 100 days saw a public New Year's Eve demonstration in Menlo Park, and a patent application on his system of electrical distribution covering also multiple-arc distribution.

Throughout 1880, he applied for other patents, one of them covering the "feeder" which corrected the reduction in light output by lamps remote from the generators. These concepts obtain today, exemplifying a grasp of the central station lighting system which has been improved times without end, but which remains basically unchanged.

The activity which led the *Cleveland Leader* to observe of Edison

CHRONOLOGY

1879 July – First Edison experimental marine electrical plant installed.

1879 Invented first practical incandescent electric lamp. Invention perfected October 21, 1879 when lamp maintained incandescence for forty hours.

1879 Invented improvements in dynamos making them suitable for generators for his system of distribution of current for light, heat and power. Invented systems of distribution, regulation and measurement of electric current.

1879 December 31 – Gave public demonstration of his electric lighting system in streets and buildings at Menlo Park.

1880 Ushered in seven years of invention improving electric light, heat and power systems.

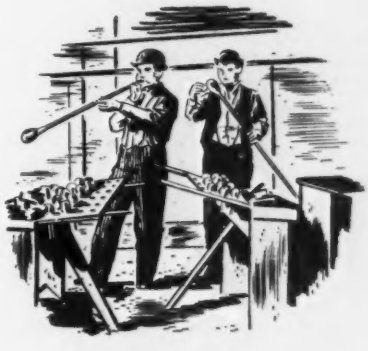
1880 October 1 – First commercial manufacture of incandescent lamps began at Menlo Park.

1881 January 31 – Opened offices of Edison Electric Light Company, New York City.

1882 January 12 – Opened first commercial lighting and power station at Holborn Viaduct, London.

1882 September 4 – Started operation of first commercial central station in this U. S. at Pearl Street, New York.

1883 July 4 – First three-wire system central station for electric lighting started operation at Sunbury, Pa.



1883 Discovered a previously unknown phenomena. Found that independent wire between legs of incandescent lamp filament acted as a valve to control flow of current. Known as "Edison Effect", this discovery is a fundamental principle of electronics.

1885 Patented system for communicating by wireless induction telegraphy between trains and railway stations; also ship to shore.

1891 Applied for patent on motion picture camera.

1893 Edison-Lalande primary cells supplied power for first electric semaphore signal on railroad.

1896 Experimented with X-ray. Developed Fluoroscope, dedicated to public domain.

1896 May 16 – Applied for patent on first fluorescent electric lamp.

1900 Beginning of ten years of work leading to invention and introduction of Edison nickel-iron-alkaline storage battery.

1902 Worked on improving Edison copper-oxide primary battery.

1907 Developed universal electric motor.

1914 Patented miners electric safety lantern.

1914 December 9–Edison's great plant at West Orange, N. J. destroyed by fire.

1915 President Naval Consulting Board. During war years he did large amount of work connected with national-defense especially concerned with forty major war problems for the U. S. Government.

1928 October 20 – Presented with Congressional Medal of Honor.

1931 October 18 – Died at Llewellyn Park, West Orange, N. J. at the age of 84, survived by his wife Mina Miller Edison, four sons and two daughters.

that "When the man dies, they will miss him at the patent office, if they don't at home," was evidenced at the close of 1880 by applications for 60 patents, 50 of which related to electrical distribution. Thirty-two covered incandescent lamps, seven dealt with distribution systems. Five covered parts—motors, sockets, fuses, meters and the like. Six more affected the dynamo. In 28 years, he took out 375 patents on lighting. 1880 began seven years of intensive development of light, heat and power systems. On October 1 he began commercial manufacture of incandescent lamps at Menlo Park. Four months later he opened the offices of the Edison Electric Light Co., in New York, and spent the year, when not taking out new patents, planning the nation's first central station incandescent lighting system. The British opened the first such commercial system, calling him across the ocean to open it in London on January 12, 1882. Before the year was out—on September 4—he began operations at Pearl Street.

It was in 1882 also that Edison patented his "three-wire" system. His earlier feeder had cut the cost of copper per lamp served from $23.24 to $3.72. The three-wire system added a 62 percent saving in copper and boosted the distribution distance one-third without additional energy losses. The three-wire system went into operation first in Sunbury, Pa., on July 4, 1883.

Of great consequence was a discovery he made some months later, on November 15, 1883, when he uncovered what came to be known as the "Edison effect," the starting point for the science of electronics. Before the year was out, he had filed a patent for an electrical indicator utilizing this discovery—first use of electronics.

In 1891, he patented the motion picture camera. The first commercial showing came three years later, in New York.

It was in 1896, within a year of the discovery of the x-ray by Roentgen, that Edison, having turned his attention to the mysteries of these invisible rays, invented the fluoroscope. This discovery he left unpatented, in the public domain, because of its value in surgery and medicine. He did, however, patent the first fluorescent electric lamp that year. A few years later, he began another of his classic quests in the electrical field, the search for an acidless battery. His ten-year search brought the invention and perfection of the Edison nickel-iron-alkaline storage battery. In 1902 he improved the Edison copper-oxide primary battery. In 1905 he improved his dictating machine and saw his "Edison effect" lamp developed into the "Fleming valve," a two-element rectifier for wireless receiving, and later the three-element Audion accredited to de Forest.

In 1915, he became president of the Naval Consulting Board, forerunner of the Navy's tremendous research facilities of today.

It was in October, 1928, that Edison received the Congressional Gold Medal of Honor. Three years later he died, if such a man can.

251-Mile Line in France Basis for 400-Kv. System

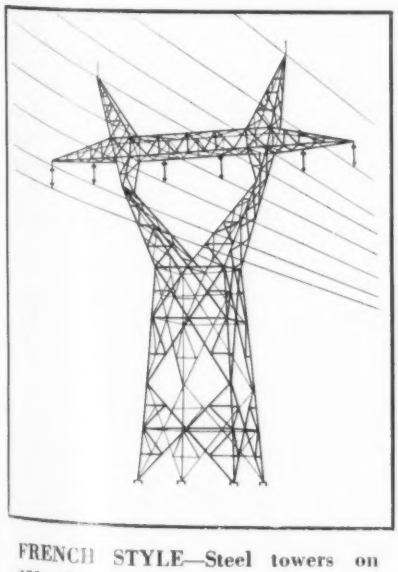
The French national electricity company, Electricité de France, at the year's end inaugurated the first current flow through a 251-mile transmission line believed by the French to be the longest, most massive, single high-tension installation in the world.

Running from the hydro center of Breuil in central France to the outskirts of Paris at Chevilly, the line now operates as a 140,000-kw., double tri-phase, 220-kv. system. Within two or three years, the company hopes to convert the same pylons to a single tri-phase, 400-kv. system.

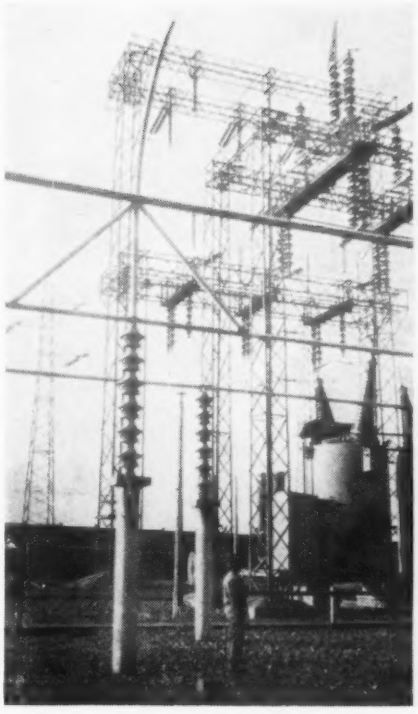
Aluminum wire is used in the six power cables which consist of 32 aluminum wires of 3.6-mm. diameter each, wrapped around a core of 19 steel wires of 2.4-mm. diameter each. This gives the cable as a whole a diameter of 26.4 mm. and a weight of 2.35 lb./ft.

The new line is designed to bring power to the Paris consuming region from a number of dam installations recently completed or nearing completion. With the largest concentration of both population and industry in France, the Paris region relies for its power to a large degree on the hydro installations in the Massif Central region.

Work on the projected 400-kv. installations is still in the experimental stage. A short section of line has been built at Chevilly, and tests are underway on it to determine the best type of cable, of break-switch, and of transformer. Among the types of transmission being studied are a single hollow wire, a hollow cable, and two wires side by side.



FRENCH STYLE—Steel towers on 251-mile French double tri-phase, 220-kv. system carry all six power cables on a single cross member, with double ground line held well above



ON TO PARIS—Arrival point for power from hydro station at Breuil is at Chevilly near Paris

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Planned Lighting Program to Be Sponsored by E.E.I.

An industry-wide Planned Lighting Program, which will provide utilities with a comprehensive promotional and educational campaign designed to increase the use of better lighting in five major markets—residential, store, school, office, and industrial—has been authorized by the Board of Directors of Edison Electric Institute. The program is to be ready this year.

A sales plan book, outlining suggested procedures, will be prepared for each of the five lighting markets and will be backed up by a complete line of promotional aids. The plan book for increasing sales of store lighting, for example, describes the characteristics of this market, the potential revenue to be secured by planned sales efforts, and the organization and methods best suited for successful selling in this market. It then presents a complete sales and promotional plan, indicating step by step the methods which are recommended and which have been proved successful in the field.

The supporting promotional and educational materials which will be furnished for each of the five markets include presentations for use by salesmen in their customer contacts, direct mail pieces, booklets, posters, visualizers, films, newspaper advertising suggestions, and other aids.

FPC Denies Safe Harbor Rehearing; Appeal Likely

The Federal Power Commission's order reducing wholesale energy rates of the Safe Harbor Water Power Corp. appeared headed for a court test after the recent denial by the commission of an application for a rehearing.

The order, which set 5 percent as a fair rate of return on the company's net investment in electric properties, represented FPC's second effort within six years to reduce Safe Harbor's rates. A 1940 reduction order of the commission was set aside by a U. S. Circuit Court of Appeals which rejected FPC's claims to jurisdiction over the corporation's operations.

In denying a rehearing of the latest order, FPC held that "no new facts have been presented . . . and no principles of law have been set forth which either were not fully considered by the commission before it entered its order . . . or, having now been considered, warrant further hearing. . ."

Safe Harbor operates a hydro project on the Susquehanna River about 8 miles below Lancaster, Pa., and sells all its electric power to the Consolidated Gas, Electric Light & Power Co. of Baltimore and to the Pennsylvania Water & Power Co., Holtwood, for resale.

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$96,000,000 Construction Planned by Detroit Edison

Detroit Edison Co. has announced that it will spend $96,000,000 in the next four years to increase the power-producing capacity of the system by 22.4 percent.

Included in the program are the final payment on the 75,000-kw. Marysville plant, and the entire cost of the Trenton Channel plant which will have two 100,000-kw. units. Other items are substations, transmission and distribution lines, transformers and meters, buildings, and automotive equipment.

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3 Damage Suits Settled

Three damage suits for a total of $2,200,000 filed against the Union Electric Co. of Missouri and its parent, the North American Co., by Oscar F. Funk, a former vice-president of Union Electric, have been settled by the companies and dismissed by the St. Louis Circuit Court. The suits alleged libel and conspiracy to drive Funk from his $20,000-a-year position in charge of the company's accounting.

ALL 4 ARE *Built-in!*

- OPERATING SAFETY
- SYSTEM FLEXIBILITY
- SPACE SAVERS
- EYE-APPEAL

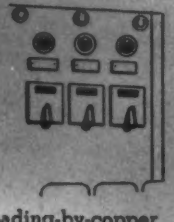
Westinghouse Outdoor Unit Substation rated 3000 kva, completely metal-clad, is tamper-proof and safe in any suburban location.

WHEN YOU SPECIFY WESTINGHOUSE UNIT SUBSTATIONS

More and more power companies are installing Westinghouse Unit Substations because they meet these four basic requirements of the modern substation—with fully built-in features:

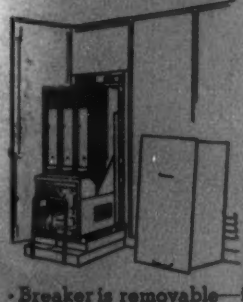
1. **Safety of operation and maintenance**—assured by removable breakers, steel barriers, positive interlocking, "De-ion" arc interruption, insulated busses, loading-by-copper temperature (makes full transformer thermal capacity safely available).
2. **System flexibility**—provided by interchangeable, "Unitized" switchgear units, allowing additional feeder units to be applied simply. Unit capacities can be selected to meet existing needs, yet provide for expansion.
3. **Compactness**—twice the capacity of conventional open substations in half the space lowers real estate costs and permits location in areas otherwise unavailable for substation use.
4. **Modern appearance**—close-coupled throat connection, with units of uniform height, gives the "eye-appeal" so important in residential areas.

These and other reasons—mobility . . . versatility of application . . . the advantages of "Unitized" switchgear . . . make Westinghouse Unit Substations the answer in distribution planning. For complete information, call your Westinghouse office, or write for B-3238 to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97119



• Loading-by-copper temperature makes full thermal capacity of transformer safely available.

• No costly structure loss—entire substation can be easily moved to new location.



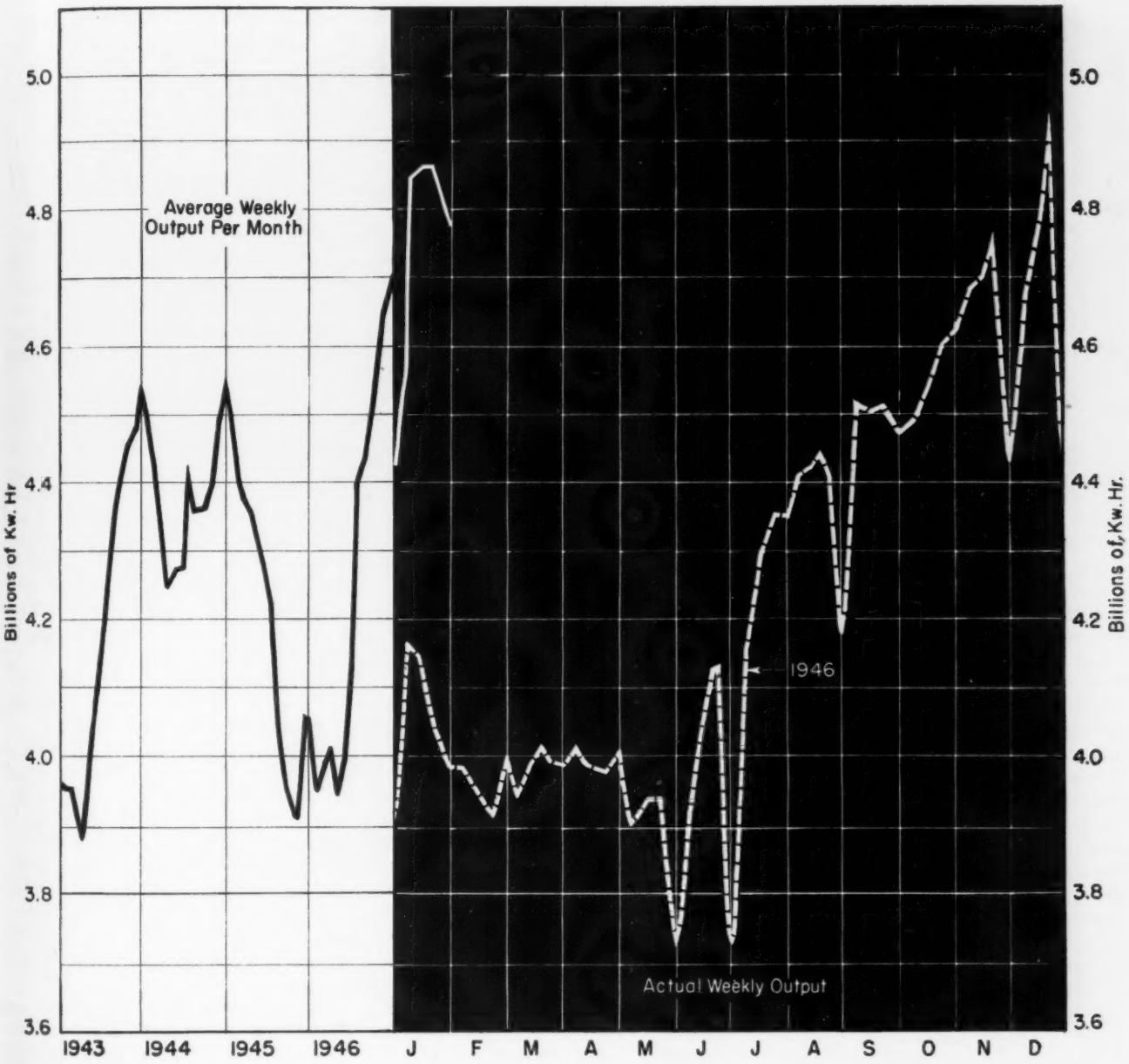
• Breaker is removable—in minutes—with full safety to operator.

• Minimum installation time and over-all cost.

For Single Feeder Substations—the last word in "Packaged Power"—the Westinghouse CSP Power Transformer performs all functions of a conventional substation.

Westinghouse UNIT SUBSTATIONS

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



Electric Output Curve Moves Downward

Following the usual seasonal trend, the electric output curve moved downward during the week ended February 1, 1947, according to figures released by the Edison Electric Institute.

The amount of electrical energy distributed by the light and power industry during the week amounted to 4,777,207,000 kw.-hr., comparing with 4,856,404,000 kw.-hr. during the preceding week. During the week ended February 2, 1946, the amount of electrical energy distributed totaled 3,982,775,000 kw.-hr., this year's figure representing an increase of 19.9 percent.

Six of the seven major geographical regions of the country showed smaller increases than were reported the preceding week as compared with the corresponding week of 1946. The Central Industrial group was the exception, showing an increase of 29.4 percent, against 26.7 percent the preceding week.

Weekly Output, Millions Kw.-Hr.

1947		1946		1945	
Feb. 1	4,777	Feb. 2	3,983	Feb. 3	4,539
Jan. 25	4,856	Jan. 26	4,034	Jan. 27	4,577
Jan. 18	4,857	Jan. 19	4,145	Jan. 20	4,588
Jan. 11	4,853	Jan. 12	4,163	Jan. 13	4,614
Jan. 4	4,574	Jan. 5	3,865	Jan. 6	4,427
1946		**1945**		**1944**	
Dec. 28	4,442	Dec. 29	3,759	Dec. 30	4,226
Dec. 21	4,940	Dec. 22	4,239	Dec. 23	4,617
Dec. 14	4,778	Dec. 15	4,154	Dec. 16	4,563
Dec. 7	4,673	Dec. 8	4,097	Dec. 9	4,538
Nov. 30	4,448	Dec. 1	4,043	Dec. 2	4,524
Nov. 23	4,765	Nov. 24	3,841	Nov. 25	4,369
Nov. 16	4,700	Nov. 17	3,985	Nov. 18	4,450

Percent Change from Previous Year

	Feb. 1	Jan. 25	Jan. 18
New England	+11.1	+13.2	+10.4
Mid-Atlantic	+ 9.4	+10.7	+10.1
Central Industrial	+29.4	+26.7	+18.5
West Central	+13.7	+15.4	+13.8
Southern States	+21.8	+22.4	+22.0
Rocky Mountain	+ 9.0	+10.5	+ 8.6
Pacific Coast	+22.8	+26.2	+23.8
Total United States	+19.9	+20.4	+17.2

Missouri Municipals Must Collect Electric Sales Tax

Assistant Attorney General Will F. Berry, Jr., of Missouri has ruled that sales taxes must be collected on the sale of electrical energy by municipally owned utilities.

Berry said that despite a provision of the new constitution which says in effect that cities and counties do not have to pay sales taxes on their purchases, "the provisions of the constitution do not prohibit the General Assembly from providing that political subdivisions shall collect the sales tax when they are engaged in any business required to collect such taxes under the sales tax act."

Berry said the sales tax act applied to electrical sales, among others, and therefore the municipally owned utilities must collect the 2 percent levy and remit it to the state.

MANUFACTURERS & MARKETS

Electrical Engineering Show a Success; More Than 8,000 See Products on Display

The new products and materials displayed by the 65 exhibitors at the Electrical Engineering Exposition last week, held concurrently with the mid-winter A.I.E.E. meeting, were witnessed by more than 8,000 utility, electrical manufacturing, and power engineers. The products shown in the surprising variety of displays centered principally in the zone of electrical industry activity that lies between the generating station and the consumer's load.

Included was a great deal of the equipment and apparatus pertaining to transmission and distribution—a new design of transmission tower, a new self-supporting aerial cable, new protective equipment and outdoor disconnect switches with rotating linkage and high ice-breaking power, transformers, switchgear, load centers, circuit breakers, instruments and controls, in addition to a variety of insulating materials. Also highlighted were the manifold applications of electronics, the multiplicity of applications covered by switches and controls, and new developments in testing apparatus.

One of the latest developments in Silicone applications shown by Dow Corning was a thermosetting resin developed and produced for use as a heat-stable bonding material for inorganic fabrics in the production of rigid electrical laminates, and for bonding finely divided particles such as powdered metals or mica, silica or carbon. Also displayed in this booth was a 25-kva., 450/117-volt Kuhlman transformer completely insulated with inorganic materials. This unit weighed 173 lb. without the case (6.9 lb. per kva.) and utilized 2,760 cu. in. of space (110.4 cu. in. per kva.).

The Owens-Corning booth displayed Fiberglas in the form of yarns, wire insulation, tapes, cordage, braided sleeving, cloth, mica combination laminates and tubing.

War Brought Improvements

The cathode-ray oscillograph, advanced during the war to measure time intervals as small as one-millionth of a second and now utilized in testing relays, circuit breakers, electronic control devices, and other electrical equipment, was the center of the DuMont Laboratories display.

A pocket-sized oscilloscope incorporating a cathode-ray tube, vertical and horizontal amplifiers, linear time base oscillator, synchronization means and self-contained power supply—all in a carrying case measuring 4 x 10 x 6⅜ in. and weighing 5¾ lb.—was featured by Waterman Products. Applications of this instrument of a special interest to the visitors included examination of electrical waves, frequency measurements, phase, shift and power modulation determination, tracing of curves representing various functions and adjustment of several types of apparatus.

An electronic tube analyzer, shown for the first time by Weston, tests the performance of all tubes exactly as they are used in their associated equipment. Also displayed in this booth was a line of photoelectric cells of the so-called barrier-layer type utilized in controlling street lights and beacons, or in switching indoor lighting on and off to maintain a predetermined level of illumination with the variations in natural light intensity.

Photoelectric controls for the lighting and drafting rooms, classrooms, store windows, and outdoor lighting controls for billboards and signs were shown by O. F. Masin. Also displayed by this concern was a new photoelectric control for street lights which is designed for distribution pole mounting and is said to require routine maintenance procedure only once a year. Incorporated in its design is a differential and time delay relay to avoid operation by lightning or clouds and to obviate cycling.

Displays of testing instruments included a Winslow insulation resistance test set featuring a heavy duty generator powered by Alnico magnets, separate from those used to energize the indicator, and a centrifugal voltage regulator. A similar purpose instrument

TRANSFORMER, SWITCHES—Displays of transformers and switches incorporating the latest improvements of manufacturers also attracted wide attention. Two typical booths were those of Standard Transformer and Southern States Equipment

was shown by Sticht and was of the battery-vibrator type providing up to 600 volts d.c. and obviating hand cranking.

A third tester operated by a power pack and consisting of a constant-potential step-up transformer and selenium rectifier giving a constant d.c. voltage was featured by Biddle. The indicator is a true ohmmeter, which covers a wide range and is independent of supply voltage. The unit is used on 115-volt a.c., circuit.

A new surface pyrometer, which is self-contained and portable and which is designed to combine laboratory precision with the requirements of a plant instrument, was displayed by Electro-Tech Equipment. A new type of tachometer shown by Metron Instrument has but one rotating part in the head, and this in effect is a rotating switch. An electrical conductor connects the head with the indicator through a flexible chord when used with the portable type and with fixed wiring in instruments designed for permanent installation. The portable type is energized by a standard flashlight battery contained in the handle while the permanently installed type is energized from an a.c. circuit. The head and indicator may be separated by considerable distance and up to 100,000 rpm. can be registered.

The Sticht exhibit of tachometers included the centrifugal, chronometric and vibrating reed instruments in portable and stationary types. Dials were shown for indicating rpm. or fpm. and these range in size from 3 to 20 in. in diameter.

A great variety of special purpose switches, such as the newly designed unit for recycling operations and including the time delay and automatic reset features, was the focal point of the Industrial Timer display. A new spring-driven "stepping" switch for selecting any desired circuit out of a total of 40 was shown by Clare.

EXPOSITION FLOOR—General view of the exposition center aisle

Circuit breakers were prominent in three booths. Heinemann Electric featured a magnetic type having a time delay characteristic. On overload an iron plunger in a hermetically sealed, liquid-filled cylinder is lifted into a magnetic field at a rate controlled by the viscosity of the liquid. When the plunger reaches the top of the cylinder the trip armature is attracted to the pole piece, operating the latch mechanism which permits the contacts to open. On short circuit, by contrast with this action, the pole piece is energized with sufficient speed to trip the latch mechanism before the plunger moves. The Metropolitan Device breakers shown were developed to simplify stock problems and to facilitate service. The units have been simplified to one basic box fitted with two circuit breakers and bussing to add more breakers up to a total of six. A multi-breaker for lighting of appliance circuits and reported as "the first low-priced, four-pole unit having both thermal and magnetic tripping action" was displayed by Federal Electric Products. It operates through a bimetallic tripping element with a coil-less mechanical trigger which functions within one cycle even on minor shorts. A time delay is provided for moderate overload.

Several primary cutouts of the drop-out type were on display. One of these shown by Southern States Equipment featured the double venting of gases created by the blown fuse links, high-pressure solid copper contacts with self-wiping action, toggle action release of the cartridge and protection from sleet. In one type, three fuses are installed in the same unit and as one blows a second is automatically cut in, and, if needed, a third. Another type of drop out fuse for installation on circuits of 92-138 kv. with interrupting capacities up to 1,000,000 kva. was shown for the

KEEN INTEREST—Study of insulation testing at the Biddle booth and of the new technique of rodding the fish line through the conduit at the Cope display also developed a keen interest among the visitors and resulted in many personal demonstrations

first time by Schweitzer & Conrad.

A combination lightning arrester and fuse together with the company's newly designed secondary racks and eyes were displayed by Hubbard. The arrester is the gas discharge type and the fuse may be of either an open type cutout or a link type fuse holder according to requirements. New designs in air break switches were featured in both the Elpeco and the Southern States booths. Both reported high ice-breaking characteristics and simplifications in adjustments.

Sprague Electric displayed their new carrier current coupling together with a general line of capacitors. Tobe Deutschmann featured a new fault-locater which operates on the principle of matched impedance and distinguishes between an open and a shorted circuit. A prefabricated oven utilizing infrared lamps was displayed by Trumbull Electric. Elliott featured an all-steel motor which is reported to have a 10 percent weight saving and a 25 percent space saving over the conventional cast iron construction. Electric Arc demonstrated an arc welding machine in connection with induction heating to prevent molecular strains. T. J. Cope featured a new development called the "pneumatic fish line" which is reported to cut rodding costs and time.

Standard Transformer displayed its latest design of distribution transformers. Surface metal raceway wiring systems, connectors, insulation materials, tools, leather equipment and motor vehicles made up the remainder of the exhibits.

The exposition, which was the first industry-wide, post-war electrical equipment show to be held on a national basis, was staged by the International Exposition Co. under the direct supervision of Charles F. Roth, president, and E. K. Stevens, manager of the exposition.

American Smelting Raises Copper Price 1 Cent; Other Producers Hold at 19½

American Smelting & Refining Co. last week advanced its price for domestic refined copper one cent a pound to a level of 20½ cents a pound. This action has so far not been followed by any other leading copper producers, which maintained their price unchanged at 19½ cents a pound.

The immediate cause of the advance by American Smelting is the general shortage of copper, particularly No. 1 copper wire scrap, the highest grade. Heavy bidding for this type by custom smelters and others forced the price to higher levels. Concurrently, this grade of scrap is quoted at 18¾ cents a pound delivered to the refinery. After allowing for refining and other costs it is equivalent to 20½ cents a pound.

Another factor in the higher price is the diversion of scrap from custom smelters, — the normal purchasers of this material. Some dealers, who sold to smelters, are now sending the scrap to refiners on a toll basis. This means that these dealers retain ownership of the scrap, pay the charge for refining, and the metal is returned to them in marketable refined forms.

Copper consumers, in the meantime, may be forced shortly to make up the deficiency in the domestic supply through direct purchases of metal produced outside the United States. They will have to pay a four cents a pound import tax in addition to the purchase price. Sales of foreign mined copper are currently being made to users outside the United States at prices ranging from 20 cents a pound up to 20½ and 20¾ cents a pound.

Copper reached a high of 23⅞ cents a pound in 1929, but then dropped precipitously. During the war, OPA held the price at 12 cents, raising it to 14⅜ cents just before OPA expired. On November 12 the price advanced to 17½ cents and eight days later to 19½ cents.

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U. S. Files Anti-Trust Suit Against Cable Companies

General Electric Co., General Cable Corp., the Okonite-Callender Cable Co., and the Phelps Dodge Copper Products Corp. were named defendants in a civil suit filed in Federal Court in New York City, charging violations of federal anti-trust laws. The companies were charged with conspiring to monopolize and restrain trade in the high-tension electrical cable industry.

The suit was filed by the Justice Department. The government's complaint relates specifically to fluid-filled cable. This is a type of high-tension cable in which the electrical conductor is surrounded by a sheath containing oil or gas which prevents deterioration of the conductor and leakage of electricity.

The suit seeks to cancel the alleged agreements between the defendants and to obtain a decree that the defendants have used their patents unlawfully.

Two European corporations, the Societa Italiana Pirelli, of Italy, and the Compagnie Internationale Pirelli, of Belgium, were named co-conspirators in the suit, but not defendants.

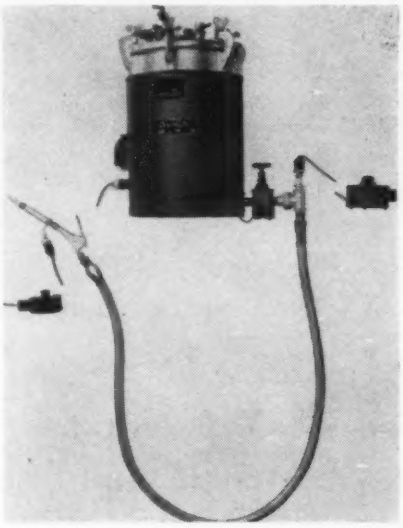
NEW DESIGN—Among the many new designs shown were the Elpeco new airbreak switch and the U. S. Steel aerial cable and suspension tower. As in other booths, the newer designs "generated" many "meaty" discussions on "current" problems

NEW EQUIPMENT

Heated Tank Simplifies Dispensing Insulating Material

AN ELECTRICALLY heated tank for the melting and dispensing under pressure of the heavier process materials, which flow faster when warm, has been announced by the Sta-Warm Electric Co., Ravenna, Ohio. The equipment is reported to handle insulating and sealing materials utilized in the manufacture and repair of electrical apparatus and appliances.

The tank pictured is a 10-gal. De Vilbiss pressure tank to which the Sta-Warm Co. has applied the heating installation, the variable-dial thermostat control, and the 1-in. thermostatically controlled, electrically heated, wheel-type valve. Similar tanks can be furnished with capacities of 30 to 60 gal. Compound melters can be furnished with the pressure head in capacities of 5, 10, 15, 25, 50 gal., or larger. Standard tanks are designed for connection to 220-volt, 60-cycle, single-phase circuits but specials are available for other circuit characteristics.



To the 1-in. heated valve is attached electrically heated flexible metallic hose. This hose is available in lengths of 8, 10, 12, 15 and 20 ft. and with flow areas equal to the area of a ½-in. or ¾-in. diameter pipe. The heating element runs the entire length of the hose inside of an inner hose, with the melted material flowing between the inner and outer hose. Although the illustration shows the hose controlled by a rheostat, either a variable dial thermostat or a rheostat may be provided for temperature control. The hose will withstand a pressure of approximately 25 psi. and operate on either 110 or 220 volts, single phase. The gun is heated and controls material flow by means of a needle valve.

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Soldering Flux Available in Crayon Stick Form

A SOLDERING FLUX in the form of a crayon-like stick has been announced by Lake Chemical Co., 607 North Western Ave., Chicago 12, Ill. The product, called Flux-Stik, is non-acid. It is reported to be non-running, confining itself to the immediate vicinity of the joint to be soldered. The stick can be applied to either hot or cold metal, the company reports. It is stated to be especially suitable for overhead, inaccessible and out-of-the-way locations where cleaning of the metal is inconvenient. It is usable on copper or brass.

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Recorder Cut-Out Switch For Critical Processes

CENTRALLY LOCATED periodic temperature measurements for industrial processing have been made possible by introduction of new recorder cut-out switches which are especially adaptable to the petroleum and chemical industries, the Brown Instrument Co., Philadelphia, Pa., reports.

The cut-out switch consists of a double-pole, double-throw, mechanically operated, pushbutton switch for multipoint indicators. The switch, according to L. Morton Morley, the company vice-president and general sales manager, provides low cost installations for many critical applications.

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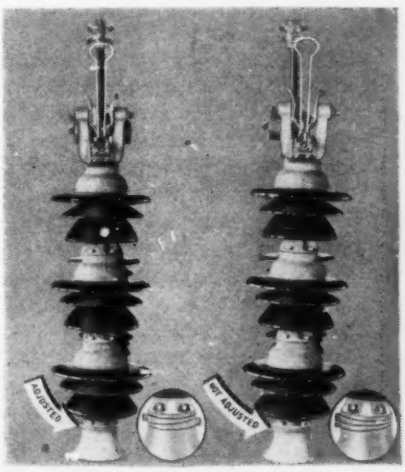
New Switch Aligned By Utilizing Tapered Rings

TWO TAPERED BRONZE RINGS are utilized in the Southern States Equipment Corp., Hampton, Ga., HRHA switches for simplifying stack alignment in the field. The newly designed rings come on all switches rated at 69 kv. and above.

The insulator bases are loosely bolted, with adjusting rings in place between mounting and stack and with ring lugs diametrically opposite one another. The jaw is bolted to the top of the stack and the switch is closed for test alignment. Adjustments are made by turning the rings until a "level" is obtained and then bolts are tightened to lock the stack. Formerly alignment was made by shims.



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Two New Secondary Racks Have Many Features

TWO NEW secondary racks have been announced by Hubbard & Co., 6301 Butler St., Pittsburgh 1, Pa. They are known as the Line Type and Service Type Hub-Raks. Among the features reported are: (1) forged steel points attached through the back to form a single unit; (2) points smoothly rounded on all exposed surfaces; (3)

backs are made of heavy steel, 3⅛ in. wide, pressed to a channel shape for added strength and curved to fit the contours of a pole; and (4) alignment of points to assure even distribution of strain on the rack bolt.

Line style is available in both extended and non-extended back. Service type is available in extended back only. Both designs are available in two- and three-wire designs with 4, 6, 8 and 12-in. spacings. They are also available in a four-wire design with 4, 6, and 8-in. spacing.

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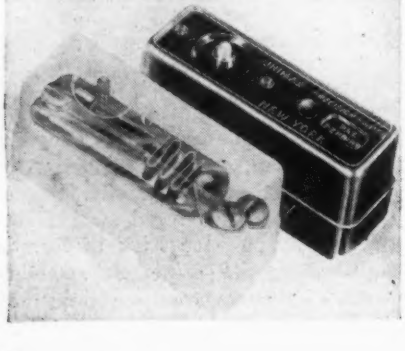
Operating Characteristics Uniform in New Switch

A NEW, COMPACT, snap-action switch designed to meet a need for a millibreak switch with uniform performance characteristics in mass production of precision apparatus is reported by Unimax Switch Corp., 460 West 34th St., New York 1, N. Y.

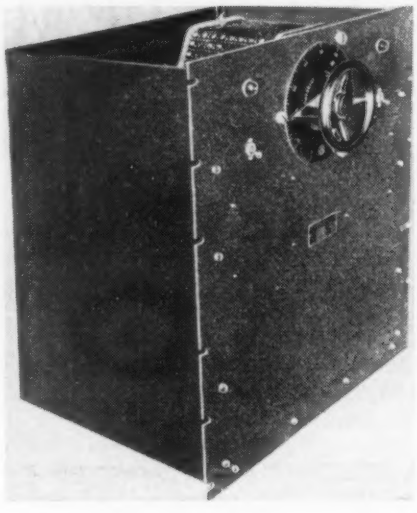
The uniformity of mechanical characteristics is said to simplify production of precision apparatus by making possible the installation of switches without need for individual adjustment of associated apparatus. Run-a-lot switches are interchangeably usable both among units in any shipment or from several different shipments, the company reports.

The moving member of heat-treated beryllium copper, with tongue ribbed for maximum stability, gains a uniform characteristic from the folded flat spring section which exerts high contact pressure and produces instant traverse. Non-rotatable actuator button assures application of actuating force to the same spot on tongue throughout life of switch, it was stated. Contacts are silver, laminated on copper; moving contact has low mass for minimum contact bounce.

For convenience in production assemblies, one mounting hole is elongated. Over-all dimensions of the molded phenolic case are 1⅛ in. x ⅛ in. x ⅛ in. Electrical ratings: 15 amp., 125 volts; 5 amp., 250 volts; ½ hp., 115-160 volts, 60 cycles; all units S.P.D.T.



D. C. Power Supply Voltage Variable Between 0 and 3,000



A NEW D.C. POWER SUPPLY designed for continuous duty, small regulation, and adjustable output voltage (0-3,000) has been announced by the Superior Electric Co., Bristol, Conn. The unit has a maximum d.c. output current of 0.5 amp. and operates from a 115-volt, single-phase, 50/60-cycle source.

The power supply uses a full-wave bridge rectifier consisting of four type 866/866 A tubes. A time delay relay is provided which allows the filaments to heat up before the high voltage is applied; line fuses are incorporated for protection against possible overload conditions. All major components are either potted in metal enclosures or are hermetically sealed.

As shown in the illustration, it is supplied for mounting in a standard 19-in. relay rack panel. An external metering panel is available. These controls and two indicator lamps are mounted on the power supply panel; these are the a.c. line switch with indicator lamp, the high-voltage primary switch with indicator lamp, and the variable transformer control.

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New Truck Model Designs Cover Utility Purposes

A COMPLETE SERIES of new International truck models is being shown by the motor truck division of International Harvester Co., Ft. Wayne, Ind., in commemorating its 40th year in manufacturing. Emphasizing the need of specialization in trucks to meet all the varied requirements of users, officials of the division in showing the new KB line have listed many adaptations among the standard models available.

In the light-heavy duty of the type often used for line construction bodies, the new KB-10 is listed at 22,500 up to 29,250-lb. gross vehicle weight with 149-in., 161-in., 179-in. and 197-in. wheelbase. This model follows the general design of the K-10 which was announced last year for the general application field. Its engine produces a maximum of 140 hp. at 2,800 rpm.

The complete line has 15 basic models, with six additional models built in the western plant. It is stated that more than 1,000 different trucks can be provided by adaptation on this list of models, to meet any special need and load requirement. Five other heavy-duty models provide, with the KB-10, a coverage in g.v.w. ratings from 14,500 to 35,100 lb., with higher weight ratings in the parallel six-wheel models.

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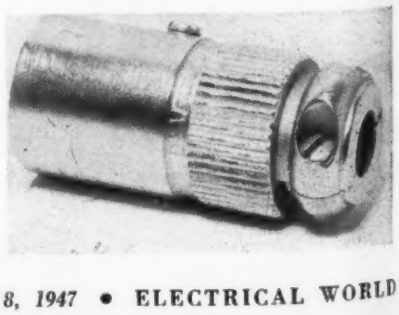
New "XL" Steel Plugs Mate with Zinc Receptacles

IN RESPONSE to a demand for steel shells and integral clamps built into the recently introduced "XL" microphone connector series, Cannon Electric Development Co., 3209 Humbolt St., Los Angeles 31, Calif., has brought out two steel shell plugs which will mate with the zinc receptacles.

The new plug carries the additional designation "SC." Over-all length is slightly smaller than corresponding zinc plug types. The integral clamp has a minimum cable entry of ¼ in. and a maximum of ⅜ in. Instead of a rib design, a portion of the shell is straight knurled. The socket insert assembly carries the latch-lock device.

The construction of the shell makes it adaptable to other uses than sound, providing the amperage requirements of the circuits do not exceed the 15 amp. rating of the three contacts, and the minimum flashover voltages not more than 1,500 volts (250 V. working voltage), under normal conditions.

Bright nickel is the standard finish although satin chrome and other finishes are available at additional cost.



Vertical Induction Motors Available Up to 500 Hp.

A NEW hollow-shaft vertical motor designed specifically for pump drives has been added to the line of General Electric Tri-Clad induction motors. Available in ratings from 1 to 500 hp., all speeds and frequencies, the new motor is suitable for use on irrigation projects, deep-well turbine pumps, municipal and industrial water-supply projects, mine-dewatering pumps, and process-industry liquid pumps.

For motors rated 10 hp. at 1,800 rpm. and larger, the new line features a system of controlled lubrication which allows just the right amount of oil to flow through the bearings, and thus prevents oil-friction loss caused by foaming and churning. Bearings are protected from rust even during standby periods since the oil level is above the top of the balls.

A large oil reservoir cast integral with the motor end shields has sufficient capacity to allow the oil to cool and recover before being recirculated. A close-running fit between the end shield and couplings protects bearings and oil reservoir from the entry of dirt even when the top cap is removed for pump adjustment. Motors 7½ hp. at 1,800 rpm. and smaller have grease-lubricated bearings.

Bearings, punchings, and windings are cooled by a double-end ventilation system which draws in air at both ends of the motor and discharges it through openings in the stator frame. A protective "self-release" coupling prevents damage to the pump or motor caused by motor reversal. This consists of a top half-coupling keyed to the pump shaft and a lower half-coupling keyed to the motor shaft. It reduces installation time and provides a simple method of checking motor alignment, the company reports.

The top cap is easily removed, making the coupling conveniently accessible. When impeller adjustments are required, one person can remove the top cap without the aid of rigging. The motor can be lined up from the top, it was stated. Adjustment of the pump shaft is accomplished by means of the locking nut on top of the coupling.

Rotor windings in all ratings provide suitable starting torque with the low starting current needed for full-voltage

starting. The hollow shaft is bored and has ample thickness to insure rigidity. The outside diameter of the rotor is ground, and the complete rotor is dynamically balanced.

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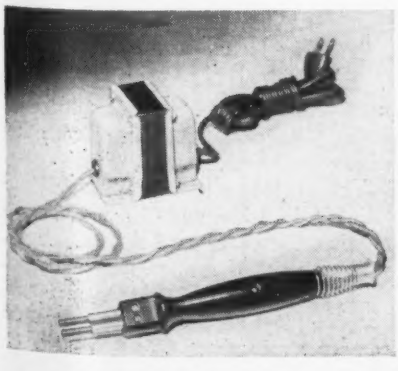
New Soldering Tool Designed for Light, Hard-to-Reach Jobs

A NEW SOLDERING TOOL designed especially for fine precision work has been added to the line of electrical products produced by the Thermador Electrical Manufacturing Co., 5119 District Blvd., Los Angeles 22, Calif. Balanced and proportioned, the ST-1 Soldering Tool



is designed for radio repair and general assembly jobs, as well as for the hobby enthusiast and model builder when soldering in hard-to-reach locations.

The carbon holder, which uses ⅛-in. carbon tips, is reported to keep carbon breakage to a minimum by maintaining constant pressure on the carbon at all times.

It requires no preheating, simply plugs into the nearest convenience outlet. The fork type design eliminates the necessity of grounding work. The tool features a streamlined molded Bakelite handle which is light and easy to use, thus increasing operator efficiency. The handle is equipped with a spring strain relief on the flexible heater cord to eliminate fraying and breaking.

Standard equipment includes a "Thermatite" transformer, 6 ft. of rubber-covered primary cord and 4 ft. flexible cotton-covered secondary heater cord. The voltage across the carbon rods is 6 volts. Specifications: 96 watts, 50/60 cycles, 110-120 volts a.c.; length including carbon, 7 in.; weight of tool, 3 oz.; total weight including transformer, approx. 3½ lb.

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Tubes Life Tested under Pulsed Operating Conditions

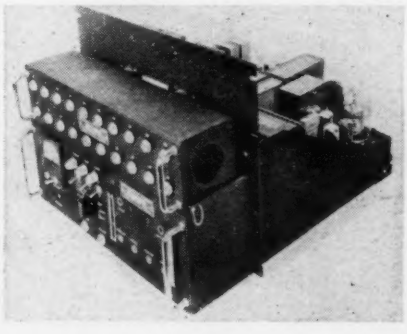
EQUIPMENT suitable for the life testing of receiver type tubes under pulsed operating conditions has recently been developed by Chatham Electronics, 475 Washington St., Newark 2, N. J., in cooperation with the Evans Signal Laboratory at Belmar. This apparatus consists basically of four units—a power unit, a control panel, a pulse modulator and a tube test rack.

It is designed to provide all potentials normally required for receiver type testing. Specifications are: plate—0 to 500 volts at 250 ma.; screen—25 to 400 volts at 100 ma.; bias—0 to −200 volts; and filament—0 to 15 volts, a.c., at 12 amp., and 0 to 3.5 volts, d.c., at 2 amp.

For applications requiring greater power an auxiliary supply has been furnished providing a plate voltage of 0 to 1,000 volts at 250 milliamperes and a screen voltage of 25 to 400 volts at 150 milliamperes. All supplies are equipped with an external connection to provide increased filament voltage if desired.

The modulator has been designed to deliver a positive pulse, adjustable from 50 to 350 volts, to the grids of the tubes under test. Pulse current of 10 amp. at an 0.01 duty cycle is available.

The width of the pulse may be varied from 1 to 25 microseconds by means of plug-in type delay lines. Its repetition rate may be adjusted from 500 to 2,500 times per second. The output impedance of the modulator is 100 ohms; however, a matching system has been provided to allow use with ex-



tremely low impedance loads.

All operating adjustments of the power supply and modulator are available from the control unit. A self contained multirange meter allows all supply voltages and currents to be read without use of auxiliary apparatus. The entire assembly is designed to mount in a standard 19-in. wide relay rack and when equipped with the 500-volt power unit.

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Recorder Chart Legibility Improved by Neutral Gray

RECORDER CHARTS printed in neutral gray to improve legibility have been introduced by the Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio. This is reported to make it easier for operators and supervising engineers to read the charts because of the greater emphasis given the various colored charts by the neutral background.

New charts are said to be especially helpful on recorders installed where lighting is poor or where a clear view is not obtainable. Charts are made from wax engraved plates. Center holes are punched simultaneously with the printing to insure accurate centering.

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'Dogs' Cooked Dielectrically In New Electronofire

ELECTRONOFIRE, the new high-frequency frankfurter and sausage-type meat cooker, has been announced by Electronic Chemical Engineering Co., 1235 East Olympic Blvd., Los Angeles 21, Calif. The machine is actually a specialty dielectric heater. The meats are placed inside the pyrex tubes which are in turn, inside the applicator.

The unit is designed for operation on a 220-volt, 60-cycle, single-phase circuit. It utilizes four tubes, is fully shielded, and will deliver up to 350 hot dogs per hour.

New Auger Bit Set Facilitates Pole Drilling

A NEW AUGER BIT set to facilitate pole and wood-boring has been announced by Bruno Tools, 9330 Santa Monica

Blvd., Beverly Hills, Calif. The set consists of an 8¼-in. shank and a number of boring heads packed in a plastic case. It comes in two sizes—one containing six boring heads ranging from ⅝ to 1¼ by eighths, the second containing eleven heads covering the same range by sixteenths. Both sets are available with square shanks for use in hand braces as well as straight shanks for portable or bench drills.

In use, different size holes are drilled simply by changing the boring head size. This is accomplished by loosening a set screw and inserting the proper size head. The boring head locks securely with a positive-seal precision fit. The set screw acts as a safety lock.

Boring heads are made from high-carbon tool steel and are heat treated. The smooth, fluteless shank of heat-treated chome-moly steel is reported to eliminate clogging or binding.

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Lower Temperature Aluminum Solder

A LOW-TEMPERATURE, rub-on solder which All-State Welding Alloys Co., Inc., 96 West Post Road, White Plains, N. Y., has recently developed, is reported to open a new range of soldering applications for aluminum work. It is an alloy which is applied without flux and is stated to be economical to use.

Its prime application, the company reports, is in the assembly of aluminum shapes and wire in production work. It may also be used on aluminum castings. The company also recommends it for filling and soldering where tightness is essential but strength is unimportant; for the repair of blow-holes; for building up worn surfaces on aluminum castings; as well as for salvaging and making changes on foundry patterns. It can also be used in repiring cracks in aluminum cylinder heads and filling its surface defects where high temperatures must be avoided. The alloy is known as All-State No. 39 aluminum solder rod and has fair corrosion resistance, it was reported by the company.

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Capacitors for Blocking And Bypass Applications

LECTROFILM capacitors in case styles 65 and 70 in the most popular ratings have been announced by the transformer division, General Electric Co., Schenectady 5, N. Y. Supplied in low-loss plastic cases, the units are designed for radio-frequency blocking and bypass applications where Q and temperature coefficients are not within the critical range.

Four ratings are listed in the 65 style case: 0.0001 muf. at 3,000 volts d.c., to 0.1 muf. at 500 volts d.c. In the case 70 style, four ratings are also listed: 0.0001 muf. at 5,000 volts d.c., to 0.1 muf. at 750 volts d.c.

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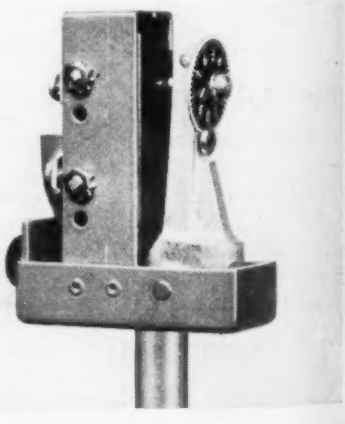
Temperature Limit Switch Usable at 700°; 10 Amp.

A NEW SMALL and lightweight temperature limit switch usable with temperatures up to 700 deg. has been developed by the Burling Instrument Co., 251 Springfield Ave., Newark, N. J. Designed primarily for aero-



nautical use, the switch is rated at 10 amp., 24 volts at 40,000 ft. altitude. It is of the snap-action type.

The switch, model "S-V," is 3⅛ in. tall, 2¼ in. wide, and 1¼ in. thick. Including the cover and the 7⅛ tube, it weighs 9 oz. The use of an aluminum tube suitable for lower temperatures reduces the weight somewhat more, the company reports.